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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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February 19, 1975 Vol. IX, No. 8

NEWS IN BRIEF

14 Airlines Pan IBM On Costs of Software

Special to Computerworld

LONDON – IBM met here twice recently with a steering committee formed by 14 international airlines using IBM's International Passenger Airline Reservation System (Ipars) to discuss the airlines' dissatisfaction with the system, the *London Times* has reported.

The airlines claimed Ipars' software overhead costs are much larger than they had expected and also complained about Ipars' lack of reliability, the *Times* said.

One airline said it had been forced to buy a third computer because the two planned were inadequate. Another said the capacity of the system is reduced to less than one-third in actual operation because of excessive overhead taken up by operating systems and software packages.

The airlines said they were pioneers with IBM's large, time-sharing systems and are now totally dependent on them.

The 14 airlines are Aer Lingus, Alitalia, British Airways, CP Air, El Al, Japan Air Lines, KLM, Pan American, Qantas, Singapore Airlines, South African Airways, Swissair, TAP and Thai International.

Another meeting is planned for May.

Time Theft May Rate Grand Larceny Charge

Special to Computerworld

SEATTLE – A computer time theft hit possible grand larceny proportions recently at the University of Washington here.

Using four unauthorized account passwords, the time thieves used approximately three hours of Control Data Corp. 6400 time, worth $1,700, from the university's computer center. Much of the time was used in generating prime numbers, using a program produced by a Basic interpreter.

Police have arrested a suspect and a case is being prepared for presentation to the prosecutor's office, according to Wayne O'Brien, assistant director for systems and operations at the center.

O'Brien declined to comment on reports that the thief or thieves were high school students. He did say, however, the alleged time thief had copied a valid account number and password accidentally left out by another user.

Thefts of computer time at the center are not uncommon, although an operating procedure change last fall has eliminated most incidents.

The computer time theft report was part of a campus crime summary released to coincide with the university's second annual "Police Community Action Week."

Controversy Marks DP License Hearing

DPers with two very different viewpoints testified before the Government Regulatory Committee of the Massachusetts Legislature last week.

At issue was a proposal for legislation to license data processors which the Society of Certified Data Processors (SCDP) has sent to each of the 50 states [CW, Dec. 11].

In Massachusetts, the SCDP proposal has appeared as House Bill 4964, introduced by Rep. Wilfred E. Balthazar (D-Hudson).

SCDP Envisions 'Learned' DPers

By Patrick Ward
Of the CW Staff

BOSTON – Licensing of DPers is both necessary and inevitable and ought to start now, Kenniston W. Lord Jr. said in a prepared statement for state legislators holding preliminary hearings on a licensing bill here.

The licensing proponents "seek to establish a top-level stratum, known as the 'Licensed Professional Data Processor,' " according to Lord, president of the Society of Certified Data Processors (SCDP).

"We envision this stratum should be declared as a 'learned profession,' with specific educational requirements, codes of ethics and practices with enforcement mechanisms, knowledge of certification requirements, legal responsibility, accountability and leverages," he said.

The aim would not be "to merely confer licenses upon current practitioners of data processing, but rather to establish a professional stratum into which they may progress."

In his statement, Lord played the role of devil's advocate against the SCDP's assumptions.

For people who feel DP is not a profession and thus ought not to be regulated, Lord asked if the DPer is any less a professional than the television repairman or licensed practical nurse.

As for the idea DPers should police themselves voluntarily, Lord called it a "fine idea, but the . . . evidence indicates

(Continued on Page 4)

Proposal Called 'Hoax' on Users

BOSTON – A proposed law to license DPers "is a tremendous hoax on the business community," in the opinion of Charles Schoenian, treasurer/controller of the Carling Brewing Co.

Schoenian spoke last week against passage of the bill at a meeting of the Massachusetts Legislature's Government Regulatory Committee here.

In a written statement, Donald B. Tuson of the same firm said "the proposed bill appears to be an effort by a few individuals to attain professional status through legislation and, by the same legislation, provide a guarantee of work not justified by the nature of the DP industry."

Carling has built fully integrated management systems without employing anyone who possessed a Certificate in Data Processing (CDP), Tuson said, noting major accounting and consulting firms evaluated and praised these systems.

A CDP holder was unnecessary, Tuson observed, because "in most businesses the body of knowledge required to successfully implement computer applications more closely fits the knowledge of a skilled tradesman or mechanic than that of one of the learned professions."

Second-Class Citizens

If the porposed licensing bill is passed, many people with the training and experience to earn a decent living in data processing would suddenly become second-class citizens, he said.

The proposed law would limit competition from nonlicensed but qualified data processors under the guise of protecting the public, he said.

The types of certification examinations given, decisions on who can take the exams and who will pass "will not be based on user requirements," but will be decided by members of a group who already classify themselves as CDP hold-

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FTC Spokesman Says

UPC Has Antitrust Angle

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – The use of computerized supermarket systems using the Universal Product Code (UPC) has antitrust as well as consumer protection aspects.

And a leading UPC consultant said last week the supermarket systems can be profitable even with price marking.

There are antitrust ramifications of the UPC systems in the area of food manufacturing, according to a Federal Trade Commission (FTC) staff member. About 1,800 food processing manufacturers have adopted the UPC symbol for source marking and, by the end of 1975, 80% of the items going through supermarkets will be marked.

But there are almost 30,000 food processors and manufacturers representing the remaining 20% of items in supermarkets. And there will be increasing competitive pressure on these firms to convert to UPC marking if they want to survive in the supermarket environment.

Many of these suppliers are small firms for whom the UPC conversion could be prohibitive in cost. "This could have significant competitive implications for smaller food chains and independents," the FTC staff member said.

It costs an estimated $1,000 to redesign a labeling machine for the UPC marking method and this could be prohibitive for smaller suppliers, he added.

Potential Savings Promising

On the plus side, the potential savings of the UPC systems seem very promising, the FTC source said. Even with the retention of price marking, there are savings for the average supermarket that installs a UPC check-out system.

A spokesman at McKinsey & Co., Inc. agreed with this evaluation. McKinsey has been consulting for the industry since the supermarket marking systems were first developed.

The savings, even with prices on the items, are still there, the spokesman said. In a $60,000/week store the projected "hard savings" are about $34,000/year.

If prices had to be put back on "dry grocery products," the savings per year would be lowered by $6,000 to $8,000, he estimated, adding this is still a good return on the investment in UPC equipment.

One result of retaining individual price marking will be to slow down the rate of UPC supermarket installations and the smaller, medium-size stores may no long-

(Continued on Page 2)

Army Surveillance Data Turns Up Two Years After Its 'Destruction'

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Surveillance data on civilians and civilian organizations gathered by the U.S. Army prior to 1971 and ordered destroyed by a Department of Defense (DOD) directive were never destroyed but instead were filed with the Army's foreign intelligence records gathered since last June.

The admission came in a recent Army Department news release which explained the 400 microfilm documents, computer-indexed by name of individual, name of organization and by topical event, were found recently.

The release was issued by Secretary of the Army Howard H. Callaway, who said the files now would be screened to eliminate all non-DOD individuals. During the screening period, he said no one would be permitted to access the files without his specific permission.

The recent announcement directly contradicts assertions the Army made to the Supreme Court in January of 1972 in the case of Laird vs. Tatum. At that time, Solicitor General Erwin N. Griswold, who represented the Army before the high court, said it had been "overzealous" in its surveillance on civilians, but the files were, by then, a dead issue since all records relating to civilians or civilian activity had been destroyed.

Incident Reports

The existence of the data banks first came to public attention in January 1970 with the publication of an article in the *Washington Monthly* by Christopher H. Pyle, who had served two years with Army Intelligence Command as a captain.

According to the article, incident re-

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Union Seeks Clause to Bar POS Layoffs

By Patrick Ward
Of the CW Staff

WASHINGTON, D.C. – The Retail Clerks International Association wants to insert a clause in both new and renewed contracts with supermarkets to prevent the layoff of any union member when a store converts to an electronic checkout system.

The clause would not, however, prohibit personnel loss through attrition, a union spokesman pointed out. Since the supermarket industry normally has a high employee turnover, the widespread use of point-of-sale (POS) systems would inevitably lead to "fewer members and fewer jobs," he said.

The clause, already reflected in a Baltimore-Washington area contract, states: "Should the employer intend to substitute electronic checkout systems for existing equipment in any store, the employer agrees to notify the union in advance and to provide the union a list of all employees regularly assigned to the store on the effective date of the utilization of that system.

"Employees may continue to be transferred to other work or laid off . . . provided the layoff is for reasons other than the installation of such a system."

Effect Unclear

The union spokesman said the transition to electronic scanning of unpriced supermarket items could mean 45% fewer jobs in the stores' checkout areas.

While it is still unclear what the effect on other store employees might be, there could be a labor-intensive transition period during which store employees have to affix coding to unmarked items, he noted. But the growing trend to source marking will make that more and more unnecessary, he said.

Consumer groups, he said, "are really uptight" about the possibility that POS will put an end to price marking on store items. The retail clerks union and consumer groups are cooperating to introduce legislation to keep the prices marked on items, he mentioned.

He expects passage of such laws in San Francisco and other major cities and in state legislatures as well. This will have a major impact against curtailment of price marking, he said, especially because the "image of the supermarket is at a low ebb."

The union official said he thinks supermarkets will eventually be forced into retaining price marking after they convert to electronic checkout systems.

Army Surveillance Data Turns Up

(Continued from Page 1)

ports concerning civilians were gathered from 300 field offices throughout the country and sent to the data banks maintained at Army installations such as its Intelligence Command Headquarters at Fort Holabird, near Baltimore.

There, the reports were keypunched and processed by computer.

The system permitted the Army to "correlate trends and like incidents" and allowed intelligence officers to compile a list, for example, of all the incidents in which a particular person was involved, according to an Army spokesman.

Other sources said incident reports were also gathered by local field offices from police and local newspaper clippings, as well as such major news services as the Associated Press.

In addition to collecting incident reports, the Intelligence Command also collected information on "possible subversive activity" by civilians, and the "names and addresses of influential people in certain groups."

The Army's official reason for maintaining the list of names and addresses was to call on leaders for help in quelling riots, but Pyle suggested it was actually maintained in order to give the Army a list of people to be arrested.

Later, testimony before the Senate Subcommittee on Constitutional Rights revealed the Army maintained files on the membership, ideology, programs and practices of virtually every activist political group in the country.

The same hearings revealed that, at the height of data collection in 1970, the Army had information on 18,000 American civilians, most of whom were on file for participating in lawful political activity.

Data was filed in dozens of manual files and at least four computer data banks.

With much fanfare, the Army abandoned its computerized data bank on lawful civilian political activity that year, but failed to report that a microfilm data bank with a computerized index apparently containing much of the same information was retained.

Five years after the Army announced the destruction of the civilian files, it has announced once again that the files will be destroyed.

The existence of the files and the announcement of their pending destruction bears heavily on the outcome of a case filed against DOD Secretary James Schlesinger last February by the American Civil Liberties Union (ACLU) on behalf of the Berlin Democratic Club and others.

In the suit, the ACLU is asking for an injunction against such surveillance; the destruction of all files, recordings and photographs so collected; and damages

The Berlin group, which supported Sen. George McGovern in the 1972 Presidential race, is a branch of the American Democratic Party

The data still held by the Army includes names of individuals and organizations involved in the draft resistance movement, activities at off-base GI coffeehouses and participants in various civil disturbances, the ACLU said.

UPC May Encompass An Antitrust Angle

(Continued from Page 1)

er find the new systems effective from a cost standpoint.

"We really don't yet know whether the communication of price information can be accomplished in some way other than pricing each individual item," the consultant said.

Most of the opposition thus far evidenced at UPC supermarkets is coming from consumerists instead of the average consumer, the consultant said. Asked for a definition, he defined consumerists as those spokesmen who say they speak for the average consumer.

But these spokesmen may not accurately portray the concerns of the typical supermarket shopper, he said.

The supermarket industry plans to carefully survey shoppers in UPC stores to assess their feelings on the absence of pricing. These surveys will be very important in determining how the UPC installations will evolve.

In the meantime, it is unfortunate that several bills are being proposed that require items to be priced, the McKinsey spokesman said.

"If the retail clerks afraid of being put out of work combine with the consumerists, there is a reasonable chance that some premature legislation gets passed. This is particularly true on the state and county level," he said.

The supermarket industry is now considering about four different market research proposals to survey shoppers and some of these surveys are being formulated with the assistance of consumer protection groups.

"We have to determine what is an adequate level of price information," the consultant said.

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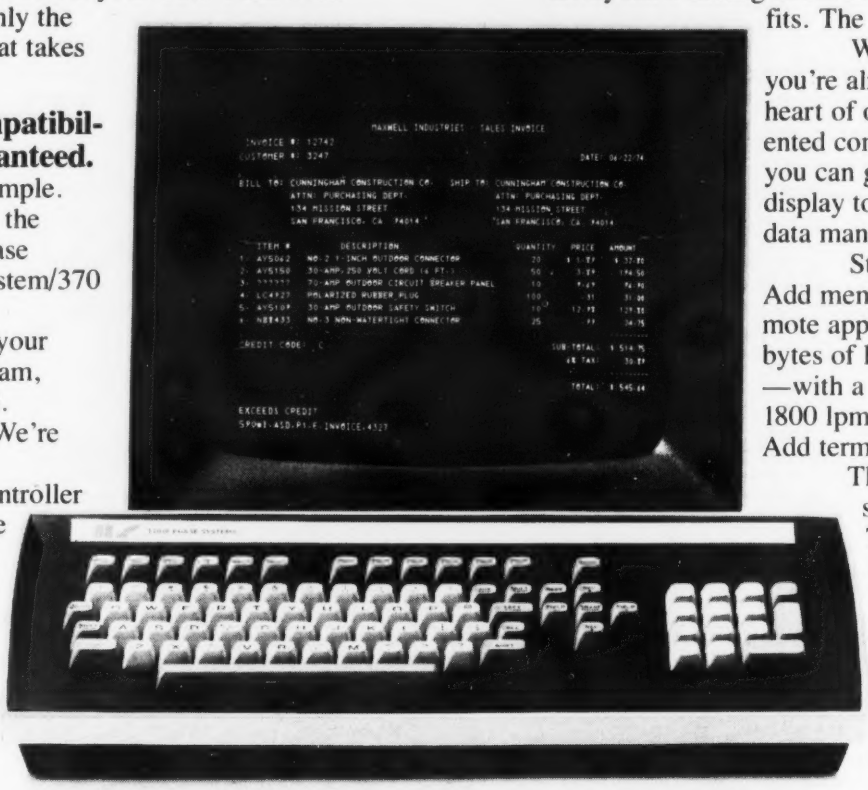
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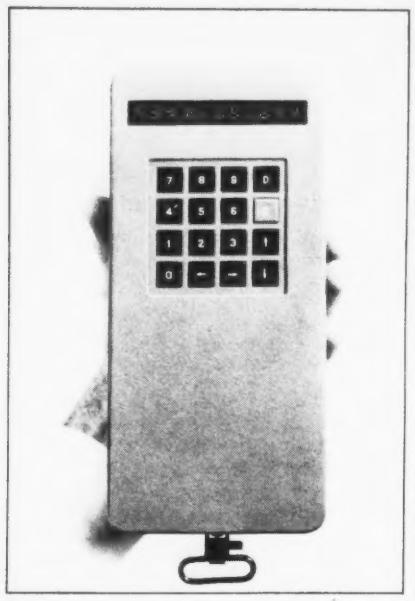

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Adapso Told DP Postal Rules Not New

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – Recent regulations defining time limits under which DP materials being transported between a data center and a user are exempt from "letter" classification and mail charges [CW, Jan. 8] are "clearly advantageous" to DP companies, according to a Postal Service spokesman, and "those who benefit from the suspension [should] be willing to meet reasonable recordkeeping requirements" to show the suspension is not abused.

Responding to a protest from the Association of Data Processing Service Organizations (Adapso), Lewis A. Cox, general counsel of the Postal Service, explained, "DP materials are neither more nor less 'letters' under [the new] regulations than they have been for the past several decades.

"Nearly 50 years ago, a published opinion of the Post Office Department stated punch cards were 'letters' within the meaning of the Private Express Statutes.

"As far as I am aware, postal authorities have consistently taken the position that the fact that a message or communication which otherwise qualifies as a 'letter' is in a form which permits it to be processed automatically does not exempt it" from the statutes.

If the Postal Service were to rescind the new regulation, as Adapso requested, "the result would be substantially more restrictive of carriage of DP materials outside the mails than what is permitted under the regulations," Cox continued.

Limited Loophole

Before last October (when the time limits went into effect), "only DP materials as qualified under the heading 'matter sent for auditing or preparation of bills' were excluded from the 'letter' classification," but even that was a limited loophole, Cox said.

"For example, if any data were retained by the processing office for its action or bookkeeping records, the materials . . . became 'letters.' "

While the rules set up in October "had the effect of including as 'letters' certain materials previously deemed to be excluded, the suspension [allowed by the new regulations] had the effect of excluding all qualifying DP materials from the restrictions of the Private Express Statutes – a far broader exclusion than was previously allowed."

Turning to Adapso's concern for the "massive recordkeeping burden" on DP firms to monitor compliance with the time limits, Cox told the association's executive vice-president, J.L. Dreyer, the Postal Service "would hope the firms would be able to develop efficent procedures that would cost far less than the postage which might otherwise be involved."

If there is documentation showing the cost of the needed recordkeeping is in fact burdensome, Cox added, "we would be interested in examing it, since we certainly do not wish to impose unreasonable burdens."

In a Catch-22 ending to this letter, Cox told Dreyer "any firm which is concerned with whether its practices are in compliance with the statutes in the light of the October regulations may wish to review the question of whether those practices were in compliance with the statutes before those regulations were adopted."

Who should conduct the review and what the firm should do if it finds itself in violation were questions left unanswered by Cox.

'Learned Profession' Envisioned by SCDP

(Continued from Page 1)

the idea is impractical, untenable and unworkable."

Lord agreed eithics and professionalism can't be legislated, but said it is possible to legislate parameters to provide quality standards, accountability and evaluative and testing mechanisms.

As for waiting until job descriptions are better defined, Lord said the legislation would quickly cause them to be better defined.

For those who say state licensing laws will hinder entry of talented women and minority workers into the field, Lord stated the bill is not structured that way.

A "DPer-in-training" category would provide time for any practitioner to obtain the skills to pass any licensing requirements, he said.

As to the criticism that "licensing would be discriminatory against those who can't take tests, including semiliterates," Lord said a registration board can provide oral exams for them. Besides, "semiliterates can hardly perform the DP function in the first place," he commented.

'Numerous Incompetents"

In DP's headlong expansion, there has been little standardization on the qualifications of persons entering the field, on the choosing of staff for DP work or on the programs to train people, Lord said.

Consequently, numerous incompetents are working on systems that could affect the public, Lord said. The licensing legislation would allow the State Board of Registration it creates to "establish minimum enforceable educational requirements," he said.

There "is no 'profession' [without] the ability to keep a fraudulent or incompetent practitioner from the practice," he added.

Bill Called 'Tremendous Hoax'

(Continued from Page 1)

ers, he added.

"Since they are not paying for the work that data processors are called upon to perform, they should not determine what a data processor should be capable of doing," he said.

Both employers and fellow employees in DP evaluate someone by how effective he is in developing an end product, not on his academic credentials and certification, Tuson said.

"The biggest thing wrong with the law is there is so little correlation between a degree and the reasons why someone would want to hire a DP person," Steven L. Patt told the legislators.

Patt, a graduate student in chemistry at Harvard, said "the whole thrust of the bill is wrong.

"I doubt if DP could be adequately defined," he said, since "this is the broadest of fields."

Thus "it's not clear to whom these rules apply." How would they deal, for example, with the dishwasher repairman of the future who replaces worn microprocessors, he asked later.

"Anytime the state is reaching out to control something it ought to have really good reasons," he said.

When first reports of the Los Angeles check fraud case [CW, Dec. 18] reported "computer manipulation," one observer stated the incident provided 120% justification of the need for licensing DPers, Patt recalled.

But, he noted, the fraud actually turned out to be manual forgery of stolen checks.

The push behind licensing is part of a general trend to blame the computer for everything, Patt said, but licensing would not stop DP criminals.

Often these people are more competent than average staffers and would thus be more likely to be certified, he explained. They decide to commit a DP crime because they gradually have been tempted by a situation, and licensing wouldn't change that, he asserted.

Erring DPers already face more important legal penalties than removing a license, he said, stating, "licensing just opens up a whole ball of wax."

Tuson added there is no evidence that licensing benefits anyone economically except certified data processors. "Nor is there evidence that licensing and/or certification are needed to promote public safety, health or welfare," he added.

Asked for his impressions after the hearing, Rep. J. Michael Ruane (D-Salem) said that the proposed act appeared to have a lot of flaws. He also wondered how it would affect a city's DP department in recruiting personnel.

The Government Regulatory Committee, he said, "evaulates all licensing applications requested in the state . . . with the aim of protecting the consumer as well as we can."

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Stresses Compliance With 1956 Consent Decree

Bell Refutes Antitrust Charges, Asks Suit Dismissal

By E. Drake Lundell, Jr.
Of the CW Staff

WASHINGTON, D.C. – Stressing the regulated nature of the communications industry and a previous consent decree with the government, AT&T has strongly denied violating the antitrust laws and asked the Federal District Court here to dismiss the government's latest action against the firm.

In addition, AT&T's present structure is the most efficient and effective, the Bell reply to government charges said, indicating users might have to pay higher prices if AT&T were restructured by the government.

The reply to the government charges [CW, Jan. 29] said "the Bell System is not in violation of antitrust laws because it has committed no anticompetitive acts.

"The company has complied with all regulatory and court orders pertaining to competition in telecommunications services and equipment," the reply added.

The Communications Act of 1934 showed a congressional intent that the communications industry be structured as a regulated monopoly, the Bell brief stated, and the Federal Communications Commission has upheld that interpretation over the years.

AT&T also said it was complying with a 1956 consent decree, and therefore it shouldn't have to undergo a new suit.

Suit Seeks Divestiture

The government suit against AT&T seeks to have the firm broken up by having it divest itself of Western Electric, Bell Laboratories and its Long Lines operation.

In addition, Western Electric would then have to be split into at least two companies, if the government is successful in its action.

Western Electric "is managed in the interest of the Bell System's goals of quality service at reasonable rates for the users of telecommunications services rather than as an ordinary commercial manufacturer whose primary objective is the maximization of its profits," Bell said in its reply.

"Western achieves substantial economies and savings in product development, manufacturing, scheduling, engineering, distribution and operating costs resulting from coordination, planning and unusually high productivity.

"These savings are passed on to the operating units of the Bell System and their subscribers in the form of lower prices," the Bell reply continued.

Similarly the integration of Bell Labs into the overall Bell System is important, the reply alleged, because "Bell Labs must assure the compatibility of each new development with the many billions of other components of the continuously evolving nationwide telecommunications network.

'Not an Ordinary Enterprise'

"Bell Labs is not an ordinary commercial enterprise engaging in research and development for profit. Bell Labs' inclusion within the Bell System permits the efficient realization of the fruits of its research in the design and development of innovative systems, in the adaptation of existing designs to improve system and equipment capabilities and in the support of all phases of telecommunications services," the reply added.

In addition, "the integration of Bell Labs within the Bell System permits the necessary and effective coordination and collaboration between Bell Labs and Western," it said.

As another argument against splitting off the two units, the reply noted they "also perform vital services . . . in the areas of national defense and space."

Similarly, the Long Lines department is an integral part of the system, the reply said.

"Decisions as to the ownership and operation of particular facilities within the interstate network are made so as to maximize efficiency and minimize the cost to the public," the reply noted.

"Through the centralized control exercised by Long Lines, the interstate telecommunications network is able to utilize the most efficient combination of facilities and equipment available to serve its present and future users," the brief said.

Overall, "the efficient operation of the Bell System requires the integrated capacity of the system to provide the equipment and facilities needed to meet the growing and varied demands of the public for service and to conduct basic research and development continuously to improve the quality and efficiency of equipment and facilities," the brief claimed.

"The comprehensive federal and state regulation of the rates charged and the profits earned by the Bell System has insured that the efficiencies, technological advances and the cost savings resulting from the unitary Bell System enterprise have been passed on to the users of telecommunications services," the brief continued.

Bell noted it has opposed the application of new specialized common carriers by taking the position that such carriers would result in wasteful duplication of service, frustrating the most efficient use of telecommunications resources and resulting in higher prices to the average user.

At the same time, the Federal Communications Commission has only allowed such entry under regulated circumstances, Bell said, rather than permitting free and open competition.

Bell, the brief said, "has sought and will continue to seek in good faith to comply fully with the orders entered by the regulatory agencies . . . subject of its right of judicial review thereof."

Ground Already Covered

Along with its stress on the need for a unified telecommunications service and the regulated nature of the business, the Bell brief also pointed out the firm is currently operating under a consent decree signed by it and the government in 1956 to settle an antitrust suit brought in 1949.

That judgment "did not require divestiture of Western and did not provide for any other relief directed toward the alteration of the Bell Systems as an integrated unitary enterprise," the brief noted.

"For the past 19 years . . . the Bell System companies have complied with and relied upon the final judgment," the brief said, adding that suit covered much the same ground as the present one.

In addition, Bell indicated the Justice Department should have taken this case back to the court with jurisdiction under the 1956 consent decree if it wanted it strengthened or changed.

"No application has been made to that court for modification or termination of the judgment," the Bell brief said.

NCIC Switching System Bid Put on Levi's Desk

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The Federal Bureau of Investigation (FBI) has submitted for the U.S. Attorney General's approval a plan for a nationwide switching system that would link the National Crime Information Center's (NCIC) Computerized Criminal History System with computerized information systems in each state.

FBI Director Clarence Kelley, Law Enforcement Assistance Administrator Richard Velde and Deputy Attorney General Lawrence Silberman met recently in Quantico, Va. to discuss the plan before submitting the final draft.

Newly confirmed Attorney General Edward Levi "will have final approval of the plan," a Justice Department spokesman said.

Single-State Offenders

The switching system will decentralize computerized criminal histories on all single-state offenders and refer inquiries from state law enforcement agencies about single-state offenders to the state where the records are retained [CW, Oct. 30].

Criminal histories on multistate offenders as well as persons convicted of or wanted for federal crimes will be retained by the FBI in the NCIC system.

Senators James Eastland (D-Miss.) and Roman Hruska (R-Neb.), chairman and ranking minority member, respectively, of the Senate Judiciary Committee, had been assured by the former attorney general, William Saxbe, that no switching system will be implemented without their approval, and that has not changed, the Justice Department spokesman said.

In addition, the system will conform to whatever federal legislation is passed to regulate criminal information systems, he added.

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Chattanooga Judge Rules City Can Lease — Not Buy — Its 370

CHATTANOOGA, Tenn. – A judge has ruled that this city can continue leasing the IBM 370/140 it installed without open bidding in 1973 but cannot buy it or accumulate purchase credits toward its purchase.

Acting on their own, James Cardell and Lawrence Harwood, Honeywell (HIS) and NCR branch managers respectively, had charged the city's no-bid action violated city ordinances and also deprived them of their right to earn a living.

The ruling was a standoff, in the opinion of Michael McMahon, counsel for the city.

But to opposing attorney Arvin Reingold, the verdict showed "the city in its original procedure did not act in good faith toward other suppliers."

Asked to Bid

Cardell and Harwood said they had asked to bid for a proposed replacement to the city's 360/30 over a year before Chattanooga installed the 370/145.

Chattanooga's city DP manager, Howard Lewis, could not say for sure whether HIS or NCR were told ahead of time about the city's plans to upgrade.

Lewis added, however, that no HIS representative had called on him from 1968 on, nor had he heard from the local NCR representative until that person heard the city was planning to put in a 370/145.

No Need for Bidding

The city said there was no need for open bidding on the machine since it came under a previous lease agreement with IBM and thus bypassed the city ordinance requiring bids on any equipment contract costing over $2,500.

The HIS and NCR plaintiffs argued there was evidence the city expected to collect credits and eventually purchase the IBM machine at a price below competing equipment.

The judge said the city did have the 370/145 under a lawful lease agreement which did not require bidding, but ruled Chattanooga is not entitled under a matter of contract to any purchase credit.

"There is a substantial question as to whether the defendant city could derive any benefit therefrom," since that could conflict with the city ordinance requiring bids on purchase contracts, the ruling noted.

Reingold said Cardell and Harwood may appeal the decision.

Banking Group Urges Code of Ethics Search To Guard Client Data

By E. Drake Lundell Jr.
Of the CW Staff

PARK RIDGE, Ill. – Bankers should launch an industrywide program "to sharpen definitions of customer data confidentiality and to heighten bank staff awareness" of their responsibilities in this area, according to the Bank Administration Institute (BAI) here.

A top-level task force should study how banking uses personal data in order to develop a workable code of ethics for the industry to follow, according to a recent report from the BAI's Assessment of Concepts and Technology Division.

At the same time, the report revealed more than 80% of the bankers responding to a recent survey felt it would be desirable for the banking industry to have a clearly defined code of ethics relating to confidentiality of customer data in data bank systems.

However, the same survey revealed 60% of the banks polled presently have no formal code of ethics specifying the banks' responsibility in protecting confidential information.

The report also said many of the legislative proposals to cure or regulate business practices in this area are "impractical because they do not take the realities of personal data use into consideration."

But "it seems likely that if these concepts were made law, they might encourage the development of large-scale computerized personal data banks, contribute materially to the confusion that already exists in the field and substantially increase the cost of business operations," the banking group also said.

Give Control to Individuals

Instead of having the government control or police all personal data systems, rules providing an individual with adequate tools to protect his own data from abuse should be established, the report suggested.

"Possibly personal data abuse is too complex to be solved adequately by comprehensive laws and needs specific treatment in each important sector of our society," the report noted.

These rules, the institute suggested, could be developed on an industry-by-industry basis with the institutions in each industry working with customers to develop "mutually agreeable" guidelines about the handling of personal data.

"These activities might, if necessary, be coordinated at an industry or governmental level. If it became apparent that self-regulation did not work on an institutional or industry level, then the state or federal government could enact appropriate legislation," the institute added.

The report said bankers should take the lead in developing such self-regulation since "the confidentiality of personal data is a cornerstone of bank-customer relations."

The top-level task force envisioned by the institute to study the issue and make recommendations would consider:

- "The different kinds of personal data sets commonly used by banks and the assignment of 'degree of privacy' classifications to each set.
- "Development of a 'personal data ethics' code that can be communicated to bank personnel and to bank customers so they will clearly understand what degrees of privacy and confidentiality banks will normally apply to personal data.
- "Clarification of banking's position in attempting to safeguard customers' data from governmental searches.
- "Development of a program to have bank customer data receive the same privileges given to doctor/patient or lawyer/client data.
- "Recommendation of penalties within the bank for violation of the personal data ethical code.
- "Clarification of procedures for maintaining personal data accuracy."

Congress Gets Bills to Delay EFTS

WASHINGTON, D.C. – Proposed experiments with electronic funds transfer systems (EFTS) could be dealt a fatal blow by two bills introduced into Congress recently which would ban all such projects until at least July 1976.

The bills – which are identical – would impose a moratorium on all EFTS experiments that interface directly with the public unless those experiments were started before Dec. 19, the date similar action was proposed in the last session of Congress.

The measures are aimed at stopping the development of EFTS until the National Commission on Electronic Funds Transfers is able to complete its work. The commission was created also during the last session of Congress.

Rep. F.J. St. Germain (D-R.I.), the sponsor of the bill in the House, indicated there was concern that experiments into EFTS could preempt the results of the commission's work if allowed to go unchecked. St. Germain was the House sponsor of the bill creating the commission.

At the same time he expressed concern that large banks or large groups of banks might develop interstate EFTS that could impact their smaller competitors, who may not be able to afford such systems.

'Impose a Moratorium'

The bill would specifically "impose a moratorium on the receipt of deposits or the making of loans by financial institutions, through the means of electronic methods of funds transfers."

This would specifically prohibit banks and thrift institutions from operating terminals or branches at any place of business other than those "whose premises are devoted primarily to the transacting of business of financial institutions."

This includes, but is not limited to, "grocery stores, department stores, automobile service stations or sites accommodating vending-type machines."

At the same time, however, the bills would permit interbank funds transfers by electronic means since "automated and nonautomated clearinghouses" or other businesses conducting exchanges among financial institutions would be exempt from the bill.

No date has been set for hearings on the measures either in the Senate or House, but a spokesman for Sen. William Proxmire (D-Wisc.), the Senate sponsor, said hearings could begin in March in the Senate.

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Course #1010 –

Practical Data Communications Systems and Concepts

This course will give you the information you need to master the newest developments in Data Communications. Led by the nationally recognized teleprocessing consultant, Dr. Dixon Doll, the course covers recent changes in areas like SDLC. HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of satellite carriers. This seminar runs two days, and total cost, including workbook, reference materials, luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for a reduced rate of $300. Current schedule is as follows:

Chicago – Jun. 2-3
Orlando – Jul. 2-3
Washington, D. C. – Jun. 9-10

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This course runs for 3 days and costs $350., including course materials, continental breakfasts and luncheons. Additional registrants from the same company qualify for a reduced rate of $300. Current schedule:

Los Angeles	Los Angeles Marriott	March 3-5
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But Timidity May Blunt Impact

UK Computer Society Seen Passing Watchdog Proposals

By Joseph Hanlon
Special to Computerworld

LONDON – The British Computer Society (BCS) could become a strong defender of consumer rights and professional ethics by seeking out computer abuses and standing up to employers and others who do not uphold proper standards.

Proposals to implement both of these objectives are contained in a new set of BCS aims, published Dec. 5 with general support of the BCS council and expected to be adopted as official policy in April.

But a combination of timidity and lack of funds seems likely to blunt the impact of any BCS efforts. In addition, the document could lead to a confrontation between BCS and the trade unions.

The proposed aims include two particularly dramatic suggestions. One is that the BCS "support individual members anxious to carry out our standards in the face of user opposition or proposed government legislation."

The second proposes the BCS "act as an ombudsman on computer-related subjects." To do this, it should "establish a panel of members willing to act in response to requests and who will positively seek out cases of computer misuse or misrepresentation."

Wide Gap

Graham Morris, an ex-president of the BCS and chairman of the committee which developed the aims, said there was a wide gap between the ideals and practicality, however.

Support for members on ethical questions could at best be moral support, he explained. The BCS might find experts who could investigate the issue, and it could lobby management representatives of the offending firm.

But there is no likelihood of financial support for the member, nor of a public statement against the offending firm.

The BCS would not, apparently, even be willing to say definitively if a practice was ethical or not. Morris explained that the most any BCS group, including the ombudsman, could do would be to clarify the choices, such as to privacy or error correction.

It would then be a "political issue" as to what level of privacy, for example, the government or management would impose. The BCS would not decide on minimum standards in the way the civil engineering profession sets minimum safety standards for bridges, he said.

Gentle Start

The ombudsman project could get off the ground within a year, but it would not be funded by the BCS – which means its first job will be to find money.

Also, Morris said, it seems likely it would "start gently," avoiding political issues like data banks and sticking to consumer complaints about things like computer billing.

The "seeking out" referred to in the aims would probably be in the form of collecting newspaper clippings, he said.

Possible Union Troubles

One aspect of the aims could cause some trouble, Morris pointed out. It suggests the BCS "monitor carefully and continually the impact on members of trade unions."

Many more computer professionals are members of unions in Britain than in the U.S. – there are several large unions of white collar workers, for example. Morris said it was clearly not against professional ethics for a computer professional to strike for his own benefit, such as higher wages.

But unions in Britain have increasingly turned to the tactic of having just a few critical people strike, rather than all employees. This means computer staffs are sometimes on strike when other employees are not, although the issue applies to all of them.

This was done, for example, in a recent local government strike here when computer operators refused to process payments and tax demands.

Morris said some BCS members (and he said he "suspected" that he would be included in this group) would find this an "abuse of power" and thus in violation of BCS ethics. It could, he admitted, lead to a clash between the BCS and trade unions if a union were to ask computer workers to strike and were told their professional ethics prohibit it.

Systems Scrutinize Rockefeller Candidacy

WASHINGTON, D.C. – The Senate Rules Committee's background investigation on former Gov. Nelson Rockefeller prior to his confirmation as Vice-President was enhanced by information from three different computer systems, according to a recent report of that committee.

Three computer systems were searched for information on Rockefeller, his family and his associates, especially those who had received gifts from the nominee.

The committee searched the *New York Times* Information Bank, which uses a commercial computer system developed by the *Times*. It also accessed files maintained by the Select Committee on Presidential Campaign Activities through the Library of Congress' "Bib Sys" computer system, as well as the library's Congressional Research Services' on-line Bibliographic file, which uses a computer system called "Scorpio" developed by the library's Information Systems Office.

The *New York Times* Information Bank contains nearly 900,000 abstract and indexing records and can be searched from a terminal in the Library of Congress Senate Reference Center.

Providing specific leads for staff investigators, the bank has a comprehensive framework for establishing in outline form and in chronological order such topics as the nominee's political activities, his philanthropic contributions and associations and his business and financial dealings in Latin America.

The Select Committee's system, known as the Watergate file, provided Rules Committee investigators with information on meetings between the nominee, his immediate family and New York Republican leaders and White House and reelection staff members during an intensive period of fund raising by the Committee to Reelect the President.

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Editorials

If You Can't Stand the Heat...

The Data Transmission Co. (Datran), one of the specialized carriers, has asked a U.S. appeals court to overrule the new, lower rates recently approved for AT&T. The appeal is not unusual in the never-ending legal battles between the carriers controlled by the Federal Communications Commission (FCC), but it brings into sharp focus a basic problem that affects every communications user.

This problem relates to competition in an area that, until a few years ago, was regulated strictly for monopoly phone companies. In a landmark decision, the FCC said competition would be a good thing for the communications industry as long as it evolved fairly. The principle, implying that the competitive marketplace would determine which of the new carriers survived, seemed sound at the time.

In its court appeal, Datran revealed its very corporate existence is threatened by the lower rates proposed by AT&T for its Dataphone Digital Service (DDS). Datran argued its Datadial service is aimed at the same teleprocessing users that Bell wants to serve. It further claimed that it deserves the protection of the courts because AT&T set its lower rates unfairly.

This charge is complicated, but it is based on a claim that AT&T is using its DDS service as a "loss leader" while recovering the real costs by levying higher charges on other services, such as residential phones.

The user is caught in the middle of this controversy. He wants greater flexibility of services and lower costs. And he really does not care who comes out the winner in this battle.

As long as Bell competes fairly and proves its rates are based on true costs and a fair profit, Datran cannot complain.

The problems of Datran began long before AT&T announced its DDS rates. It intended from the very beginning to meet AT&T in a head-on conflict.

It is a little late in the game to yell "foul."

Proceeding With Caution

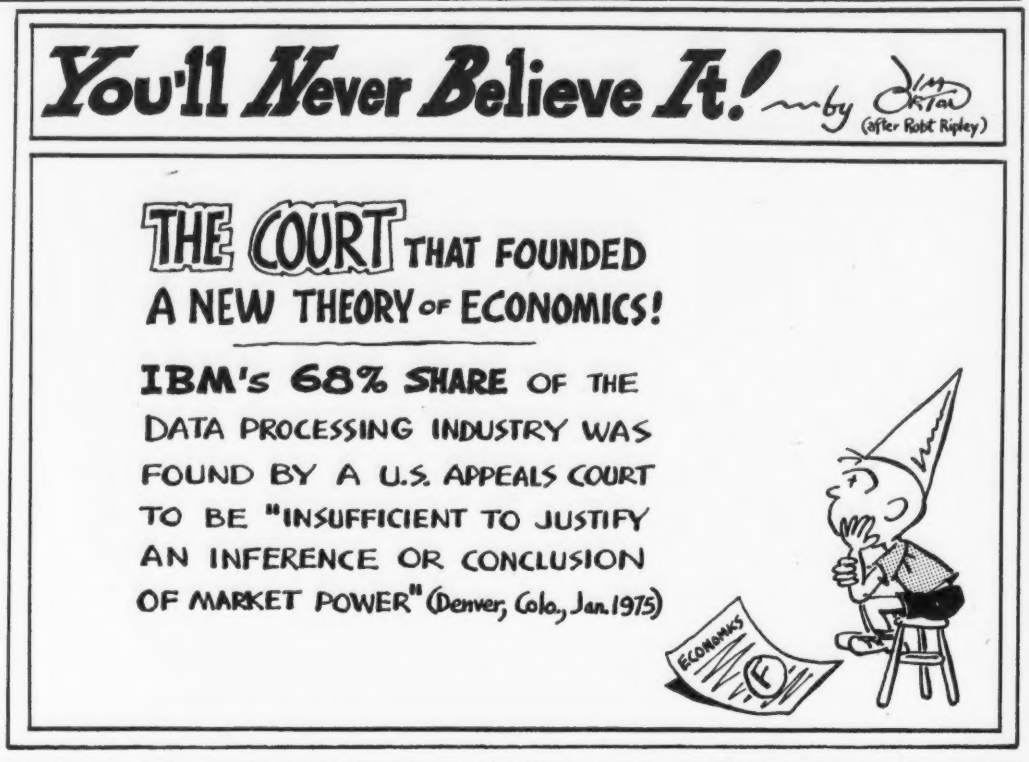
This newspaper's close look at econometric forecasting of the economy has shown the technique to be far from infallible. Even a computer loaded with an arsenal of facts cannot predict an Arab oil boycott, a drought in Asia or consumer fear at rising prices during a recession.

But there is no guarantee that an economist relying strictly on his judgment and his pencil could predict those things as well or any better. Even if he did, there would still be the problem of tracing the ripples these events could send through the American economy. And it is here that the computer can be used effectively.

Building equations into an econometric model can force more intellectual rigor and consistency on the modeler. And, once this work is done, the model can free the researcher from a great deal of drudgery and enable him to test a range of different assumptions or new approaches with relative ease.

Even so, few econometricians would take the computer's output as the final word. For one thing, the technique's success rate in the past does not inspire that kind of confidence.

Computers, then, are emerging as tools for the economist, much as they have served other specialists before. At this stage they can only enhance the researcher's judgment – but as yet they are in no position to replace it.


You'll Never Believe It!
by Jim Ryan (after Robt Ripley)
THE COURT THAT FOUNDED A NEW THEORY OF ECONOMICS!
IBM's 68% SHARE OF THE DATA PROCESSING INDUSTRY WAS FOUND BY A U.S. APPEALS COURT TO BE "INSUFFICIENT TO JUSTIFY AN INFERENCE OR CONCLUSION OF MARKET POWER" (Denver, Colo., Jan. 1975)
ECONOMICS

Letters to the Editor

Biddle's Position on IBM Would End Marketplace Competition

The Federal Communications Commission guidelines under which IBM would be allowed to enter the satellite business seem reasonable enough. On the other hand, A.G.W. Biddle's position opposing IBM's entry [CW, Feb. 5] is based upon specious arguments.

While Biddle does not object to innovation and change in the computer industry, he does object to IBM's practice of confidentiality. If, however, hardware manufacturers were to keep their doors open for competitors to view their development work and marketing strategies, there would be less and less competition and change would no longer be a way of life.

Furthermore, Biddle's contention that functional pricing will be the coup de grace is somewhat of an overstatement. AT&T has not killed free enterprise and neither has Xerox. Functional pricing can and is being used as a competitive tool by many companies.

And whether Synchronous Data Link Control (SDLC) becomes "the bundling device to tie it all together" is simply a question of what standards are going to be used. The appropriate tests for a standard are functional ability and practicality, not where the standard came from.

I'm sorry Biddle is so anti-IBM. It may be fashionable to draw a bead on industrial success these days, but common sense tells us the "predatory practices" and "market-restricting techniques" used by IBM are competitive tactics and strategies available to any company that wants to stay in business.

And staying in business should be the primary concern of every publicly held company.

Marvin C. Cruzan

Kansas City, Mo.

Decsystem Software Not 'Crappy'

In reply to Herb Grosch's "Miniperspectives" column [CW, Jan. 22], I was appalled by his statement "... when the major mini company puts out a big machine loaded down with all the crappy IBM-type systems software, all the unnecessary variety of peripherals, all the virtual vices."

It is obvious Grosch has no experience with, nor knowledge of, the hardware and particularly the software systems used on Digital Equipment Corp.'s Decsystem-10. It is no accident that approximately 20% of the computers used in commercial time-sharing services are Decsystem-10s; the cost-effectiveness of this system – and its capability to efficiently handle as many as 128 simultaneous users using a myriad of languages, application packages and utilities – far exceeds current offerings by IBM or any other competitor.

Indeed, we should all be thankful that the DEC software people have *not* written "crappy IBM-type systems software." Instead, they have developed systems software which demonstrates how general-purpose time-sharing should and can be done.

Thomas B. Mattson

Syracuse, N.Y.

Adding Some Perspectives

Herb Grosch's "Miniperspectives" prompts me to add some Decsystem-10 perspectives.

The Decsystem 10 has been around for at least seven years, so the marketing decison he referred to ("... to design, manufacture, sell, and support ... the Decsystem-10") must have been made after the minimaker discovered it had a good product.

This past summer we installed a Decsystem-10 to handle both our academic and administrative computing, replacing two "minis" (by Grosch's definition: "limited peripherals, small memories and curtailed instruction sets") with maxi price tags. Being able to escape "the efficiencies forced on the mini user" has allowed our center to provide a many-fold increase in service without adding staff and creating a very small dollar increase.

Grosch referred to the Decsystem-10 as being "loaded down with all the crappy IBM-type systems software." Unless he classifies all systems software as crappy IBM-type, I strongly disagree.

The Decsystem-10 software is reliable – we have had only three software crashes in seven months. It is easy to use; most of our 600 active student users (exposed to the Decsystem-10 for the first time) found it so.

David Copeland
Associate Vice-President
Broome Community College Computer Center
Binghamton, N.Y.

Spare the Rod, Spoil T/S Service

The article in the Jan. 29 issue describing how a British time-sharing service's security was cracked by a schoolboy with a series of tricks suggests a major gap between what should have happened and what did happen.

This 15-year-old schoolboy cracked the time-sharing service's security using techniques available to any subscriber. The fact that the service did not answer his letter indicates to me that the service has a severe lack of a sense of responsibility to its subscribers.

The fact that the teacher banned the boy from the terminal indicates a lack of understanding regarding the severity of what had happened. The only one who acted responsibly in this matter was the schoolboy himself.

Maybe he will learn that he won't be taken seriously until he actually commits a computer crime, goes to jail and is thereby qualified to become a consultant. I certainly hope that this is not so, but it is hard to tell for sure at this point.

William R. Patterson Jr.

Cleveland, Ohio

(Other letters on Pages 12 and 13.)

Getting Off the Hook

No big fish is truly subdued until they cart it off to the cannery or the taxidermist. Setting the hook, bringing it to boatside, plunging in the gaff – each is thought of as the final step. Yet at every stage the prize may escape.

In a noncomputer context we see this in the antismog battle. First the admission by Detroit that there was such a thing, then its acceptance of simple token remedies: crankcase and gas tank fixes. Then tougher rules: carburetor and spark advance restrictions. And this year, platinum catalysts and a new fuel at the gas pumps. The fish is almost boated; the Naderites are hopping up and down with glee. Then, hey presto, the Arabs, and Herbert Hooverism, and the whole ball game may have to be played over.

I worry that this may happen in the privacy battle. Certainly there has been a series of happy steps: professional awareness, public awareness, the HEW report, state activity (for instance, here in Massachusetts), the Swedish law and, only a few weeks ago, federal legislation. It's especially gratifying to us here at *Computerworld* because we've been involved and supportive for a long time.

Now, I don't see anything weird like Opec, the oil cartel, coming along to upset the privacy applecart. But I note a very quiet increase in counterforce. The private sector has awakened to the very substantial extradata-processing costs, the curtailment of convenient unregulated data exchange (between insurance companies, credit agencies and employees, for instance), and the possible remodeling or even disappearance of whole businesses based on secrecy and snooperism: the Medical Information Bureau, the Retail Credit Co. and the cops and their little Mother Lode, the Law Enforcement Assistance Administration, have been alert for some time to intrusions on their horrid game.

So, I repeat, no upheaval like the gasoline scare – but quiet attrition is a current threat. The House-Senate compromises that preceded year-end federal legislation omitted the few references to the private sector that had been hoped for and exempted law enforcement agencies from certain general restrictions. On an adjacent front, the Buckley Amendment was weakened to permit accesses to educational records previously prohibited. The attempts by Dade County, Florida to curtail credit spying are held up by a federal court.

Here in Massachusetts, the new governor seems to have much less concern for the area than the old one and talks of merging the Commission on Privacy and Personal Data with the statutory Privacy Council, which unlike the commission has interaction with criminal offender recordkeeping but which has no public members.

We've had many pleasant victories in the last year or two. But clearly we must not relax; the old dark forces inside the power structure are alert and vigorous. Evil never sleeps!

Herb Grosch

Privacy, Science Cloud Real Problem

Watch Out , Shawmut, Your Vulnerability Is Showing

A recent Taylor Report [CW, Jan. 8] discussed a problem with a Shawmut Association questionnaire. Originally, the subject was raised by readers who received letters from Edward K. Ward Jr., president of the Community National Bank of Framingham, Mass., asking them to complete the questionnaire and assuring them the data would be kept confidential.

The Taylor Report
By
Alan Taylor, CDP

Ward noted the respondent's name and address was not on the questionnaire. Some readers, however, noted a number *had* been stamped on the questionnaire, and the same number was on the computer-prepared address labels.

Later, Shawmut Association, the bank holding company which controls Community National, acknowledged two complete lists of the numbers and names had been prepared, and it did intend to trace hundreds of people to determine whether they had returned their questionnaires. This was said to be necessary to protect the validity of the results.

It was also acknowledged that Ward, and presumably the other eight bank presidents who signed similar form letters at the request of the holding company's market research department, had not investigated the truth of the letters they were signing, nor were they in a position to control the use of the questionnaires by the holding company.

The market research department and Ward both responded to questions with further questions about how this matter should be handled, rather than facing up to the problems by offering answers.

While it is not normally the practice of this column to provide free advice to such organizations, the situation seems to call for some.

The facts show the Shawmut people are quite remarkably vulnerable to insider computer fraud, despite their various security systems – or else because of them.

In a professional assessment of vulnerability, a number of points must be taken into account. These include:

- Is there anything around worth stealing? Is there any particular reason problems should occur now?
- Are employees watched sufficiently to prevent improper actions?
- Is management watched sufficiently to prevent improper actions?
- When problems occur, are the embarassed people allowed to cover up, or is real action taken to prevent matters getting out of line again?

Time of Crisis

In the banking world, January 1975 is a time of crisis, both for institutions and for individuals. While the balance sheets still show multimillions of dollars, executives and employees looking at the stock market may well be in unexpectedly desperate financial situations – without anyone knowing.

Looking at the loan situations, with heavy defaults occurring weekly, the specter of banks collapsing is more present today than it has been for 40 years.

In assessing the vulnerability of Shawmut to problems arising from either employee or management actions, therefore, the present time is particularly risky. And, of course, a bank where there are large amounts of liquid money stashed in many "dormant" accounts is an ideal target for such action.

Regarding the first point mentioned above then, the Shawmut must be regarded as a high-risk situation at this time.

Employees Uncontrolled

In any high-risk situation, the amount of vulnerability can be reduced by keeping watch over the actions of employees. The story already shows such a watch is not being kept. Shawmut again rises to a high-risk category.

For instance, the computer department produced data which was not needed (19,800 live-account address labels) and which was allegedly destroyed. But there was said to be no way in which the destruction of this sensitive data could be confirmed. I was asked to take the unsupported word of one of the people concerned.

If the actions of employees were watched properly, such destruction would have been documented at the time it occurred by an independent observer.

Clearly, the Shawmut procedures don't call for this, so employees are not subject to thorough controls.

Again, look at the action of the subsidiary bank president in giving assurances to his customers, when he was simply doing so on the theory that all the employees are nice people.

Management Unsupervised

Employees are not the only potential problem areas in banking. Management also can be a problem, although an often invisible one until just before the end.

Here, the function the computer seems to fill best (from a crook's point of view) is producing impressive but false printouts and calculating just what insertions and changes are needed in the books to bring them up to what is desired.

In both these actions, the major obstacle a crooked management has to overcome is gaining unsuspected access to the real data in the computer and then processing it to produce either the printouts or the calculations needed to keep things covered up. Market research departments, with their built-in excuses of "research purposes" are perfect camouflage for such activity and therefore should be particularly well-watched.

The data shows the market research department was not well-watched but was allowed to obtain sensitive data for which it had no real need. So again, a high-risk catagory must be given to Shawmut for management vulnerability.

The biggest problem in detecting inside crooks is determining measures to be taken when something out-of-the-ordinary is noticed. It may be something quite innocent – such as the secretary who always picks up the mail on her way to work and never gets sick. In itself, this is not important, but the vigor of the investigation that should follow is important.

If an organization treats the truth cavalierly and permits explanations such as "Well, what I really meant was the material would be kept confidential from me – not that it would be kept confidential, period" chances are careful use of ambiguous terms will permit a clever crook to get away with items a careful system would not have permitted. Shawmut currently appears to be such an organization.

In any event, the fact is Shawmut appears to permit cover-ups and window dressing. Some years ago, when I discovered a blatant weakness in its account handling, some precautions were put in with considerable fanfare. But a few months later I was told they had been abandoned, although it appears the president of the bank concerned still thinks they are in force.

Therefore, I must conclude Shawmut appears to have a high vulnerability risk in this area also.

What then is the result of all this? As I see it, the situation simply means Shawmut – and probably many, many other banks – are more lax in their computer security than they should be.

Mesmerized by computer room locks, unwilling to consider the level of danger involved in such matters, they react to inquiry by evasion and confusion. My advice to them all is: Watch out – your vulnerability is showing.

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Letters to the Editor

SCDP Proposal Brings Cheers and Jeers

How Can Anyone Claim DPers Don't Need Licensing?

As I read the comments of many on the licensing bill which has been proposed by the Society of Certified Data Processors (SCDP), it becomes apparent that most have not read the proposal.

First, a great majority have expressed concern regarding the fact that the bill would automatically license holders of the Certificate of Data Processing (CDP). The bill, as I read it, in no way implies the automatic licensing of CDPs nor does it indicate the necessity of sitting for the Institute for Certification of Computer Professionals' (ICCP) examination. It only mentions this as a possible examination to be used by a state board.

Secondly, many have decried the need for a bureaucracy to administer the program. These are probably the same people who a year ago saw no need for privacy legislation.

Licensing legislation will come just as the legislation on privacy has come. The real question, it seems to me, is: Do we want to be a part of the group drafting the laws under which we must operate or are we willing to sit back and take whatever is eventually passed and learn to live with it?

If we are in the latter group, we certainly deserve what we will surely get.

Finally, how can anyone claim we don't need licensing if he follows the problems of fraud, missed target dates and inadequate systems design reported constantly in the news media? Granted, the American Medical Association and the American Bar Association have not succeeded in keeping charlatans out of their profession, but at least they have the tools for dealing with them when they are discovered. What can we do in these cases?

I applaud the SCDP for its leadership in the matter.

Robert L. McGee

Athens, Ohio

Private Sector Intrusion

I have been reading the letters on the SCDP's licensing proposal with interest – and waiting for someone to tackle what I feel is the fatal weakness in its approach.

E. William Maxwell's letter [CW, Jan. 29] finally addresses that weakness, which is unwarranted intrusion into the private sector.

The SCDP proposal seems to suggest that each DP installation must, by law, have a licensed CDP on its staff. No wonder the idea is so unpopular. Not even the prestigious society of certified public accountants (CPA) requires every private company to have a CPA on its staff. The SCDP should reexamine its position and use the CPA approach as a highly successful model. It should push for the recognition of a public DP sector, either in conjunction with public accounting firms or separately.

A beginning already exists with the DP service firms. Licensed CDPs should be required for these public firms to certify the private firms are following accepted DP practices or to guarantee acceptable practices in the case of the service firms. For the private sector, make the CDP voluntary and don't require licensing in any case.

Corporate management would buy this approach, and the SCDP might even get a few more DPers to join its effort.

Don Breitenbach

Madison, Wis.

Time to 'Stop Snivelling'

It is interesting to note that letters protesting DP certification and/or any formal means of measuring one's competency have come primarily from people employed by utilities, hospitals, governments (state and local), very large companies or very small installations.

Authors of these letters of protest claim to be hard working, dedicated and professional people and perhaps they are, but are they managers? Are they profit-motivated? If they balk at measurement of themselves, can we not draw the conclusion they fail to measure the productivity of their programmers, systems analysts, computer operators, data entry operators and the computer itself?

Do they fear measurement on the grounds that they may be measured in part on things they feel are not directly related to DP?

Yes, I am a holder of a CDP, obtained in 1963. Is it outdated? Perhaps it is, and it might well be that one should be required to sit for the exam each five or 10 years in order to hold the certificate. I welcome the challenge!

I am in favor of state-administered certification programs which are designed by a qualified national body of successful businessmen and DP managers and administered uniformly by all states.

CPAs, doctors, lawyers and all professional groups of stature are governed by state-administered certification programs to protect the public from quacks and unscrupulous and/or unqualified practitioners. Why shouldn't businesses be likewise protected?

To my peers in the DP field, I say stop snivelling and get professional. Recognize that you have a responsibility to provide your superiors with tools of measurement that give them an unbiased evaluation of your abilities – and that you owe it to yourself to find out your areas of weakness through such exams so you have directions in which to improve.

For those of you who are, like myself, nondegreed, work harder! Nondegreed persons should look upon certification not with fear, but as an opportunity to prove their worth.

Frederick Kells-Murphy

North Haven, Conn.

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- ☐ DEMANDING
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Boy Who Yells Too Loud: A Parable for Our Times?

Once upon a time there was a little boy to whom nobody listened. He used to walk up to people and talk but they never answered. In fact, they never even seemed to notice that he was there.

One day the little boy became so frustrated that he walked into a room full of people, took a deep breath and, with all his might, yelled out, "Data processors should be licensed!"

Everyone stopped and stared at him. Then the little boy smiled. *Now* they knew he was there.

And from that day on he was known as the little boy who yells too loud.

Bill Neugent

McLean, Va.

A Change of Mind

This is the third time this letter has been started. About halfway through each of the other two, I realized I didn't really believe what I was saying: "Ain't nobody gonna tell me I gotta be licensed. Ever. Period."

Licensing is the means by which a state guarantees to the public an individual meets certain criteria in matters which affect the public health and welfare.

In theory, this is certainly reasonable. In practice, licensing limits individual freedom, sanctions some incompetents and excludes some who truly meet the spirit – but not the letter – of the requirements. In spite of this, licensing frequently does protect the public health and welfare.

Consider now the current uproar over licensing in the DP profession. On reflection, the most striking thing about the DP profession is its youth. DP has been a career field for barely 30 years and a profession even in the broadest sense for, at best, an even shorter period of time. DP is still immature.

This uproar over licensing, then, is a part of some very real growing pains. Now, growing pains are peculiar things; they will eventually go away just with the passage of time. But what's special about them is, if you keep struggling and thinking and working and fighting, you come through them with considerable maturity.

With all this in mind, it becomes clear that now is not the time to institute mandatory licensing. Not because it's not needed – in some areas it is needed – but because our current immaturity would hamper the adoption of wise, enduring criteria.

Similarly, it becomes clear that now is the time for strengthening the CDP because the efforts so expended will greatly advance our maturity. If we agonize together over an examination that fairly tests our knowledge, over a code of ethics that inspires a mature attitude, over awards and recognition of true competence, then we will emerge from the next decade with a professional certification program with a reputation to rival any other anywhere.

And as a bonus we will develop a maturity that will surprise the hell out of some of our current critics.

John Trotter

Los Angeles, Calif.

Standards Not Unnecessary

I have read with much interest the reactions of a few readers to the SCDP's licensing proposal. The letter from the three untitled individuals at North-West Services Corp. [CW, Jan. 8] contained the most drivel, so I will address myself to that particular letter.

Their first impression with regard to employee progress leaves a lot to be desired. Employee progress within a company has and should be determined by an evaluation of current work ability and results but, when hiring new personnel, there are and always have been criteria by which an applicant is rated. The CDP would simply insure the possession of a certain amount and type of knowledge.

These gentlemen must be extremely naive if they think *efficient* systems and programs are the criteria by which they progress in their jobs. Most business decision makers wouldn't know an efficient program from a loser – but they do know cost-justified results, and that's what most workers are judged on.

My dictionary defines the word "professional" as: "of, engaged in, or worthy of the standards of, a profession." That the CDP exam has been accepted as a standard is proven by the thousands that have sat for the exam.

The college grads referred to did prove they could pass an exam, with one qualification – they proved they could pass an exam for which they had prepared.

If the CDP exam is so easy, why, in some years, do more than 50% fail? I would certainly be willing to financially underwrite these three individuals taking the exam, providing they all qualify and at least two out of three pass without preparing for the exam.

Let me finish by asking: If professional standards are unnecessary, why then do the American Bar Association, American Management Association and CPAs exist?

DPers have the capacity to injure more people with one mistake than all of the legal, medical and accounting professionals combined. Isn't that reason enough for standards?

James G. Anastos

New York, N.Y.

No 'Know-It-All' In DP

Having been involved in the DP field for a total of 11 years, I have been following the licensing comments with interest.

Take a test, pass, join the society (money, please) and belong to the peer group. Theoretically you are a competent, knowledgeable, DP professional.

Bunk!

How long after the great "know-it-all" gods of DP design a test for competency and common sense will you have to wait until you can go into a bookstore and find a handy-dandy guide for passing the same test?

From what I have been able to find out about the workings of the CPA license, a neutral third party checks and verifies that the financial reports of a corporation, private company or organization are factual. I have yet to meet a person in the DP field who could go through even smaller installations' program libraries and state that the programs work properly or improperly in a reasonable amount of time.

There is no "know-it-all" in this business and, if anyone can prove otherwise, I will contribute to building that person's ivory tower.

Government control and licensing? Impossible! If the great masses at the public feeding trough cannot control themselves or work within a balanced budget, how can they control the DP occupation? Any private business that operated in the manner of the government would soon be bankrupt and out of business.

Until the corporate, private and governmental empire builders and their top-line management staffs can be made to understand that DP is only as good as the staff that handles it and can recognize the golden forked tongues that have made DP into a dirty word in a great many minds, we will have to prove ourselves by the job we do – and no amount of certification will do it for us.

Donald R. Fields

Fair Oaks, Calif.

From Control Data Corporation.

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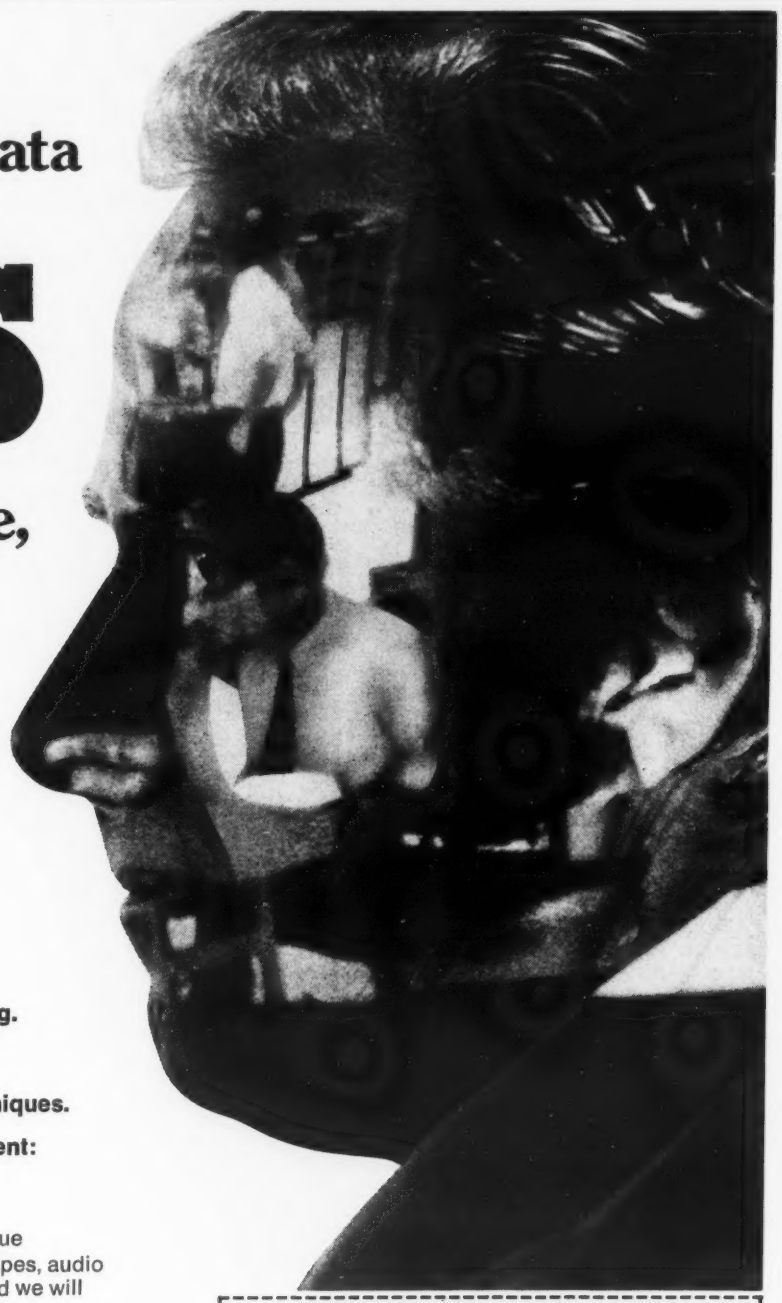

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Carl S. Now Only Sand in the Organizational Gears

By Miles Benson
Special to Computerworld

Carl S. works for a big company. A *big* company.

Within that big company are many organizations. Those organizations mesh together in ways so mysterious that no one in the company really understands them anymore.

Oh, the heads of the company think they do. Their organization charts show a nicely defined pyramid, - and the lines connecting the organizational boxes look crisp and clean. On paper.

The Sociology of Computing

But only someone like Carl S. really knows how crisply and cleanly those organizational gears mesh. And Carl S. has found a way to make that knowledge work for him. Alone.

Carl S., as you will see, is not what you would call a "company man."

Carl S. fits into the interface between the software portion of an avionics group and the configuration control organization. He has skills in both areas. Not only does he understand the intricacies of tweaking a real-time, on-board-an-aircraft computer system; he also understands the principles of monitoring and documenting that software to protect the big company from taking unwise contractual positions with its customers.

Carl S. has the skills of an electronics engineer, a computer programmer, a contracts analyst and a technical writer and a smattering of legal common sense.

He has tact and capability, and he is articulate.

He is also cunning.

It was several years ago that Carl S. first found his unique combination of skills fitted him uniquely for the interface he still works. Eagerly, he had moved into the area between the two corporate gears and smoothed out what had been a fairly rugged relationship between computer types, who spoke only softwarese, and configuration control people, who were made hostile by what they thought was deliberately confusing computer jargon.

His management had been impressed. "If you've got trouble with the configuration folk," they would say to a new programmer, "get Carl to help you." And help he did.

Something Went Wrong

But over the years something went wrong with Carl's help. Maybe he lost his confidence. Maybe newer programmers came along with skills too close to his own. Maybe the layoffs of the early '70s shook him up, made him operate in defensive mode.

Whatever the reason, Carl changed his way of helping. He began staking out a claim on "his" interface, keeping away those who might have competed with him by telling them only the minimum needed to get a specific job done.

He continued to cultivate management, making sure they knew how important his role still was, while building a smokescreen around his functions to prevent technical understanding by his peers.

"That game can only work so long," you may be thinking. Well, for Carl S. it has worked longer than anyone could have guessed. And the big company is suffering from it . . . without even knowing that it's suffering.

Let me give you an example. The radar data processing portion of an avionics software system was being documented. It had to be documented forward, backward and sideways, because the customer for the system was the Air Force.

Not only does the Air Force care about clarity, accuracy and completeness of documentation content, but it has fairly rigid format requirements as well.

And that's where Carl S. came in. The content of the radar program documentation was up to the programmer. Pretty much. But the format requirements of the Air Force, plus a few self-invented ones, were up to the configuration control organization. As interpreted by Carl S.

Well, the radar documentation technical draft, like all the other documentation from all other project programs, was given to Carl S. for review before being passed on to the configuration control people. Carl S. reviewed the technical content and made some helpful suggestions.

Then he reviewed the format. And totally rejected the draft.

Why? Really important stuff. The paragraph headings needed to be in capitals, not lower case. The page numbers needed to be at the bottom of the page, not at the top. Indentation needed to be greater. Paragraphs needed to be spaced out more.

Now, I think we all agree that kind of thing is trivial but necessary. Consistency may be a hobgoblin, but lack of it can be pretty spooky, too. The programmer took his bled-on draft back to the typist, who redid the document.

The trouble is, the same thing happened to the second draft. A few more format rules crept out of the woodwork, and *it* had to be retyped, too.

The programmer, frustrated by now but sharper than many, asked Carl for a write-up of the rules by which the document would be formatted. To forestall a third iteration.

And Carl S. refused.

It wasn't that easy, he said. Government documents defined some of the rules, the big company's documents some others. Still others were ad hoc. Read the documents, he said.

How many programmers do you know who would want to seek out and read a 25-page government treatise on document formatting? If there was anything at all else to do? After all, that's what the interface person is for, the programmer reasoned to himself . . . and dropped the request.

Well, that's how Carl S. has maintained control of his turf over the years. Incredible, but true. Carl S. *is* that little line of the corporate organization chart.

And no one yet has found a way to move past him. Little do the people at the top realize that he's really sand in the organizational gears.

That's job security, I guess. But how does Carl S. really feel about himself . . . deep down inside?

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Random Notes

Job Accounting Package Reports Usage on Nova

IRVINE, Calif. – Users of Data General Novas can have job accounting and billing capabilities under RDOS with a package from Hycom, Inc. that logs each use of the minicomputer and generates both tabular and graphic reports.

A histogram shows usage by account number; a second report lists costs, hours of use and number of jobs by user name and charge number. Billing modes are user-selectable.

Written in Fortran IV and Data General's Assembler, the accounting package, on paper tape, can be purchased for $335 from 16841 Armstrong Ave., 92705.

RPG Used to Access Bomp, Dbomp Files With Macros

ALBANY, N.Y. – RPG and RPG-II can be used with IBM's DOS-oriented Bill of Materials Processor (Bomp) or Data Base Organization and Management Processor (Dbomp) with a set of Assembler language macro instructions now available from Computer Linguistics, Inc. (CLI).

Developed by Digital Solutions, the macros interface the user programs with various files created and maintained by Bomp and Dbomp. Single or multiple master files, by themselves or with associated chain files, can be handled by the $650 package, CLI said from 24 Aviation Road, 12205.

Insurance Salesmen Aided on SBC Network

GREENWICH, Conn. – Insurance sales staffs working with prospective customers can get help with the Multiple Funding Corp. of America life insurance sales illustration service now available on Service Bureau Co.'s (SBC) Call/370 remote-computing facilities.

"Illustrations" provided by the software include determination of insurance needs, policy descriptions and comparisons, employee benefit plans and policy illustration designs.

The system conforms to New York State Regulation 74, an SBC source noted from network headquarters at 500 W. Putnam Ave., 06830.

RPG Converted to Cobol

MILWAUKEE – RPG source code is the input and ANS Cobol source code the output for a conversion package now available from DASD Corp. The $5,900 program operates under OS or OS/VS, requires 240K bytes of memory and completes "about 97% of the conversion," the company said from Suite 6, 8707 N. Port Washington Road, 53217.

Chasing Capacity – Part 2

100% Utilization 'Impossible Dream'

By Charles B. Gibbs
and Melvin J. Strauss
Special to Computerworld

The Chase Manhattan Bank, like many DP installations, tries to balance the capacities of its computer resources and the service requirements of end-user departments as cost-effectively as possible. Last week the authors outlined the formal DP-user contract the bank uses to define a job, the resources needed, processing schedule expected and the procedures to follow if the schedule cannot be met.

Just as the simple framework provided by the contracts makes the variables associated with demand manageable, so the proper perspective of constraints to capacity makes the risks associated with daily processing quantifiable and thereby manageable.

The utilization of capacity is inherently constrained by several determinants. When demand is low, the effect of these determinants is minimized by the availability of relatively large amounts of excess capacity.

However, as demand rises, the cumulative effect of the determinants limiting capacity usage becomes more pronounced, increasing risk to maintaining a high service objective.

Operational ineffectiveness (system downtime, operational problems, program and data problems, etc.) is about 91% controllable, according to our experience. Therefore, about 9% of all production (and, hence, 9% relevant capacity) will be wasted even under optimal managerial control.

Furthermore, since no two programs have exactly the same core, tape drive, CPU or elapsed time requirements, 100% usage of the computer system is virtually unreachable.

Simulations of present and expected future demand indicated that unreachable capacity at the bank is about 15% of relevant capacity.

The Spirit of 76%

These two negative forces work concurrently. As a result, there is a high risk to service with any strategy that depends on making more than 76% [100% – 9% + 15%] of relevant capacity available for processing computer demand.

The payout of lower unit cost associated with use of more than 76% of relevant capacity is obtainable only at a high risk of being unable to maintain line management's service objective.

Lower levels of risk are functions of other determinants which constrain use of capacity. A medium risk threshold is imposed by statistically insignificant variations in operational ineffectiveness and by variations in the arrival of scheduled demand.

Adding these variables into our utility workload simulation indicated our medium risk threshold exists at about 69% of capacity.

Future demand at the bank will be systems more heavily involved with predecessor-feeder relationships; as a result, the interrelationships between applications will become more numerous and more complex.

When system or application problems arise, more applications will have to be rerun (requiring even greater amounts of capacity), and a larger quantity of other jobs dependent upon these predecessor jobs will be delayed.

Thus, maintaining high service in an environment of heavy application interdependence requires more capacity reserved for failure recovery than in an environment of little interdependence. Such interdependence can be estimated and the description of demand changed to accommodate this factor.

We have estimated the extra capacity required at the bank for interdependency

(Continued on Page 17)

'Superlib' Uses IBM Functions, Backs Programmer Productivity

JACKSONVILLE, Fla. – Superlib from Generic Systems, Inc. (GSI), with emphasis on improving programmer productivity, is described as a fresh approach to a librarian system. The system can be used in IBM DOS, DOS/VS or OS environments.

Working with IBM 360/370 system library facilities, the GSI package permits users to modify character strings within individual source cards previously cataloged.

Coupled with a search facility that can be used to locate specific character strings (data names, for example), this would permit multiple corrections to a faulty name through one entry.

Parts of existing, cataloged programs may be selected into programs under development. This feature eliminates redundant coding, but more importantly allows the programmer to take advantage of previously tested coding logic, GSI said.

Superlib accepts user-provided program page and line numbers for control of changes being entered. Other librarian systems sometimes require two separate entries to change a line of code and foster excessive resequencings to keep the coding statements in an arbitrarily assigned number pattern, the vendor claimed.

The programmer's own assignments should be good enough, a spokesman added.

JCL Generated

The GSI package also supports use of a single control card with which the programmer or librarian can generate the necessary Job Control Language (JCL) for assembling, compiling and linking the programs under development. This eliminates the need for multiple JCL and cuts back on errors.

The system also includes a high-speed save/restore facility, allowing retrieval of individual members without recreating the entire library.

Superlib can be purchased for $3,000 or acquired under a lease-purchase plan. GSI is at 8282 Western Way Circle, 32216.

Benchmark, Workload Concepts Reviewed In Booklet From NBS

WASHINGTON, D.C. – The National Bureau of Standards (NBS) has compiled and the Government Printing Office has published a selected bibliography with abstracts on *Benchmarking and Workload Definition.*

Citations in the 45-page booklet are arranged alphabetically by last name of first author. Each citation has an abstract, a classification category assignment and a list of keywords.

The category assignments were developed specifically for this collection and are used as an index, NBS said.

A keyword index is also provided for researchers who know the area in which they are interested but not the author of relevant articles, a spokesman added.

An outgrowth of the July 1973 planning session for Federal Information Processing Standards Task Group 13, this bibliography includes references to only 85 of more than 250 documents suggested by meeting attendees.

Those selected are more directly and primarily related to the specific subjects of benchmarking and work-load definition than were the other documents. In addition, NBS has hard copies of all the cited material at the Institute for Computer Sciences and Technology.

Listed as SD Cat No. C13.10:405, the booklet can be ordered for $1.05 from the Government Printing Office, 20402.

A microfiche edition is also available, under catalog number NTIS COM-74-51186, for $2.25 from the National Technical Information Center, Springfield, Va. 22151.

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System 2000 Updates Ease Indexing

AUSTIN, Texas – Three new features – an optimized load module, a multiuser accounting log and a multilevel index capability – are available for the IBM version of System 2000, a data base management system available from MRI Systems Corp.

Another new feature, called the INDEX command, is now available in the Control Data Corp. version of System 2000 and is planned for future IBM and Univac versions, MRI added.

The new load module saves 40% or more in I/O CPU time, and real time when performing data base loading, the vendor claimed. Required scratch file allocations are also greatly reduced.

Many current System 2000 programs can be converted to use this feature with a single program instruction. The new process involves a special LOAD verb in the Cobol, PL/I and Fortran interfaces to System 2000.

Per User Basis

The multiuser accounting log feature allows an installation to account for system resource utilization on a per user basis, whether batch or teleprocessing methods are being employed. User resource figures are reflected in accounting records written to the log file.

The multilevel index capability decreases the access time and cost for retrieving and updating records in large data bases, MRI said. For instance in a data base of one million entries, savings of 80% or more would be realized in retrieving a record associated with a unique key value.

Savings of 50% to 75% of the I/O required to update the index can also be expected in many cases, MRI added.

The INDEX command allows a data base administrator to change any element from nonkey to key without causing a complete reload of the data base. Each execution of the command gathers data values for all elements specified in the command and creates index tables for those elements.

System 2000 permits any data element to be declared key for data selectivity. With the index capability, the initial design could favor nonkey elements. The index tables for selective new key elements can be built when their need is established at a much lower cost than total reloading, MRI said.

An IBM-oriented System 2000, including optimized load module and multilevel index capability, is $30,000, and the CDC version (with the INDEX command) is available for the same price.

The IBM Multiuser Accounting Log is separately priced and available now for a paid-up lease price of $2,500 in addition to the cost of System 2000 itself.

MRI Systems Corp. can be reached through P.O. Box 9968, 78766.

Cross-References by 'Glossary' Support Cobol on 'Any System'

NEW YORK – Cobol programmers working with any full-scale CPU that supports Cobol can get help in writing, debugging, maintaining or extending the functions of a program with the Glossary cross-referencing package from Stonehenge Computer Systems, Inc.

Glossary accepts the user's Cobol source code as input to create a listing – a glossary – of all data names, showing for each every line in the input that contained that data name.

Under user option, controlled by parameter cards, the output can be limited to show selected data names, a feature Stonehenge felt would be especially useful when trying to anticipate the impact of a change in the value of a particular data field.

Cobol reserved words, rather than data names, can be the focus of a Glossary output under still another option. The selection of reserved words to be "glossed" is another user option, one that might be helpful for programmers moving from one subset of Cobol to another when the subsets differ in the reserved words they support.

Glossary also can be used to resequence a program, print an 80 by 80 listing of the original input and to punch a resequenced source deck. The package is capable of processing multiple source decks in a single run.

The use of default values for the parameter card entries is anticipated by the system which, in effect, accepts the individual card entries as temporary replacements for the defaults. At installation time, the default parameters are customized to the customer's specifications.

Glossary's dictionary of Cobol reserved words may be sorted at execution time to accommodate the current collating sequence of the host system. Thus a single version of Glosasry can be used whether the CPU is set for Ascii or Ebcdic code.

The package runs in 30K on an IBM 360 or 370 and is available now for from $4,000 to $7,000, depending on the reserved words to be covered.

Stonehenge is at 18 E. 50th St., 10022.

'Supersnap' Pinpoints Problems

NEW YORK – Supersnap from Franklin Computer Associates, Inc. consists of one macro instruction and two modules designed to lessen the time needed to pinpoint and resolve various programmer errors in IBM OS/MFT-MVT or OS/VS modes of operation.

List is a macro that traces specified data areas and registers and produces a report of the programmer data in a format corresponding to his needs. List can also be used as a more generalized report writer, Franklin said.

Similar in basic purpose to IBM's Snap macro, Franklin's List is said to provide more information in a compact form, resulting in less printout.

Use of IBM's macro may result in several pages of hexadecimal printout, from which the user has to extract the information needed and then "translate" it into decimal notation for easier manipulation.

List provides the conversion from the hex code in which data is stored to the decimal code the programmer appreciates, Franklin noted.

Even when the programmer has no need to inspect specific areas of data, Supersnap and the List macro can be used to generate status messages as part of an annotated source listing, pointing the programmer toward possible problem areas in the coding, Franklin said.

Supersnap is available now for $3,000 from Franklin at 80 Pine St., 10005.

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Risks to Desired Service Level Measured, Managed by Chase

(Continued from Page 15)

recovery to be about 5% of relevant capacity. Thus, a low demand/service risk threshold has been estimated at 64% of relevant capacity.

Monitoring Ineffectiveness

To monitor operational ineffectiveness, we measure its complement, percent effectiveness, as a ratio of successful production to all production. Using this formula, our measurement before applying controls showed effectiveness to be 69%, i.e., ineffectiveness was 31%.

Senior management set an effectiveness objective of 85%. Under the new Production Control System (PCS), we reached 85% effectiveness in four months. The objective was then increased to 90% and two months later we achieved this goal.

Currently we are stabilized at about the 91% level. Effectiveness is quantified daily, analyzed weekly and reported to management monthly to establish strong controls should any breakdown occur.

In costing we set the same structure as in capacity and demand and, as that implies, abandoned the widely accepted DP method of costing by internal activity counts such as EXCPs, megabyte hours, etc.

The cost of any resource used as a criteria for scheduling the computer system is designated a unit hourly charge per segment. This means costing is expressed in terms of core requested times hours, tape drives times hours, etc.

All supportive units such as channels, supplies, controllers, system overhead, etc., are applied back as an overhead rate. Variance charges reflect the deviation in computer resource usage for individual programs between contractual specification and actual usage. These occur either through ineffective operations or changes in user requirements and are charged accordingly.

Our reliability program predicts problems that may arise with the processing of some application from within the computer facility, from problems or changes within the user areas and from potential problems due to changes or enhancements to the application itself.

In summary, PCS can serve as a vehicle to describe operations computer utility capacity/demand position relative to service risk; performance effectiveness; overall service provided users; service problems due to operations performance or due to users; forecasts of future capacity/demand requirements; and utilization of dedicated computer facilities.

Additionally, mechanisms are established to analyze and quickly respond to the information provided and to translate such information into costs or computer charges. These costs are used in controlling the use of corporate computer resources and the adherence of operations line managers to their objectives.

We believe our PCS represents the state of the art of computer operations management.

A more definitive, technical description of the concepts and graphics which comprise the system can be obtained from the authors.

Gibbs is manager of the Production Planning and Control Division of the Operations Department and Strauss is manager of the Computer Capacity Planning Department at Chase Manhattan Bank, One New York Plaza, New York, N.Y. 10015.

'Locator' Tunes DOS 3330 Use

CRANSTON, R.I. – IBM DOS and DOS/VS users may be able to save 15% to 40% of their disk storage space and increase processing speed as well with the Space Locator package from Data Research Group, Inc.

These gains are possible, the vendor explained, without any change in IBM hardware or software, but through a program that searches the Volume Table of Contents (Vtoc), files and the entire pack for unused space.

In addition, a list of the 12 best blocking factors for each file is generated, and a separate parameter-driven utility program is provided to handle the reblocking.

Space Locator is particularly useful to installations that have moved from 2311 or 2319 to 3330 or 3340 disks without reformatting the files to get away from the track limitations of the earlier devices, the company noted.

The program manages a variety of access methods as well as a number of disk types. Isam, Vsam, Dam and Sequential Access Method files are supported, including split cylinders, a spokesman added.

It also locates the end-of-file marks for all files on the pack or for selected ones, after which it determines the amount of unused space between the end-of-file mark and the end of Extent. Finally, it selectively relocates the end of Extent closer to the end-of-file mark.

The logic of application programs using files reviewed by Space Locator is not affected by the review itself. If, on the other hand, files are reblocked as a result of the review, programs will have to be recompiled with revised file descriptions.

The Space Locator package, including the reblocking utility, is available now for a one-time cost of $900 for the first site.

Data Research Group is at 39 Shefton Drive, 02905.

Memorex 'Resource' Logs Performance

SANTA CLARA, Calif. – IBM 360/370 users in need of new tapes or disks and interested in continuously monitoring and evaluating their DP installation productivity may be able to satisfy both the need and the interest through Memorex Corp.

The company is giving away a job accounting/computer performance evaluation package, called Resource, to any user who agrees to buy at least one year's supply of its disk packs or magnetic tape.

Resource generates both tabular and graphic output, including a daily report of jobs executed, in chronological order. This shows runtimes; resource utilization ranging from CPU time to memory usage to I/O block counts; and the cost of each run.

The package runs under any of the IBM DOS or OS environments and executes in a partition or region of approximately 100K bytes, depending on accounting file block size and the amount of main memory allocated to sorting at run time.

Memorex is on San Tomas at Central Expressway, 95052.

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Interfaces with IMS and TOTAL	✓	✓		✓	✓
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'CW 275

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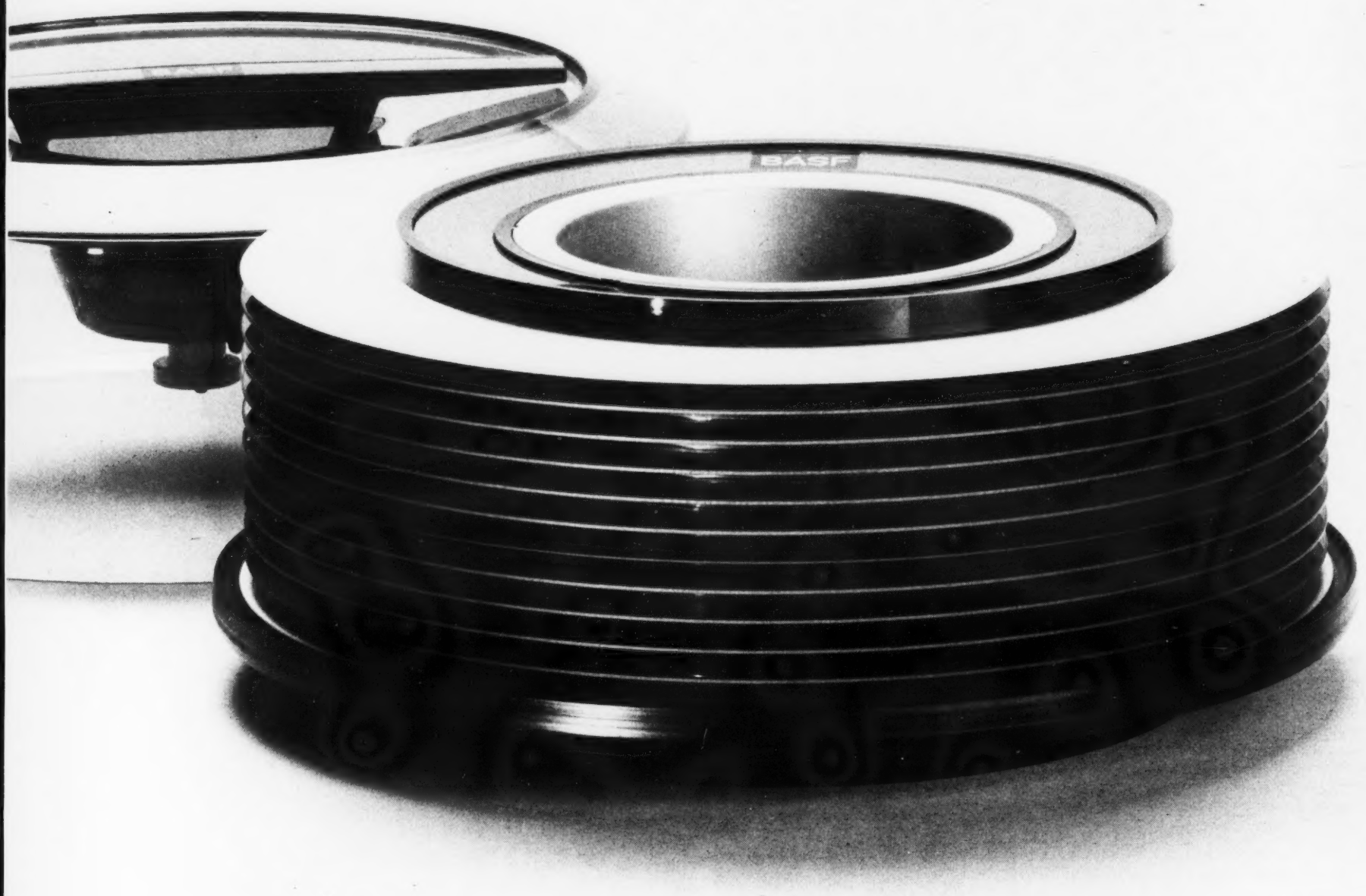

Because all disk packs conform to certain industry standards, you might think they're all equal. They aren't. The important difference is the extent to which a manufacturer is willing to go in order to *exceed* industry standards. It's a matter of making a disk pack better than you really need, because there could be times when you need it. Let's look at a few superior points of the BASF 1236 disk pack:

The binder that won't quit

As you probably know, magnetic coating doesn't stick to the aluminum disk all by itself. We use a special binding agent to produce an incredibly strong bond. The disk is sealed to prevent oxidation, so you can be sure that the coating won't peel or flake off.

Our own coating process

As the trend toward higher packing densities continues, it becomes increasingly important to monitor the thickness of coating deposited on the disk. The problem is compounded by the necessity for progressively varying the coating thickness from the outside toward the inside of the disk, because packing density is greater as the circumference decreases. For those reasons, we've discarded conventional coating methods in favor of an exclusive process using our own BASF-designed equipment.

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Following the coating operation, we use our own exclusive polishing process to achieve optimum surface regularity. We've been able to achieve a surface so flat that the possibility of a head crash being caused by uneven disks is completely eliminated. We might mention here that the coating and binder formulation, combined with coating and polishing techniques, all are important factors in achieving surface hardness, which is the ability of the coated surface to survive excessive or extended head loading.

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Like any rapidly rotating object, a disk pack will behave strangely if not perfectly balanced. In our precision balancing operation, any weighting required is screwed into place, which eliminates the potential of shifting inherent in a conventional adhesive weighting system.

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We test our 1236 disk packs to standards much tighter than those of the leading equipment supplier. If anything unpleasant should happen, we'd much prefer it happen here than on your drive. As a regular procedure, we do scratch tests to check coating thickness, impact tests to determine head crash resistance, detergent tests to check resistance to wear and temperature variations, and drop tests to make sure balance and alignment don't shift during shipment. We test to make sure our 1236 disk packs are error free.

Finally

Our 1236 costs no more than other twelve-high disk packs. You're already paying for BASF quality... you might as well have it. For more information on the 1236 or other BASF disk packs or cartridges, write to BASF Systems, Crosby Drive, Bedford, Massachusetts 01730.

You're already paying for BASF quality, you might as well have it.

BASF

Of Manufacturer's 80,000 Parts

CRT Access Brings Inventory Control

By Edith Holmes
Of the CW Staff

MILWAUKEE – CRT access to stored information on 80,000 parts and some 5,000 daily open orders gives Koehring Division here the inventory control needed by personnel throughout its plant.

A manufacturer of hydraulic excavators and cranes, Koehring has placed a total of 16 Sanders 810 CRTs in its receiving, stores dispatch, central dispatch, erecting floor, weld shop, cost, data processing, production control, engineering specifications, industrial engineering, service parts and purchasing departments.

"The terminals have given us the added inventory control we've needed throughout our operation," John Poulakos, programming manager at Koehring, said. "Given the economic situation over the last year, we'd really be in trouble without them."

Operating in local mode, the 810s link the various departments in the company to an IBM 370/135, where information on orders ranging from a single part to a completely assembled piece of equipment is stored.

Poulakos explained that, by typing in a part number or some other code, an employee requesting information receives a stock status including the availability of a part, its backlog, description, cost information and rules for ordering new parts.

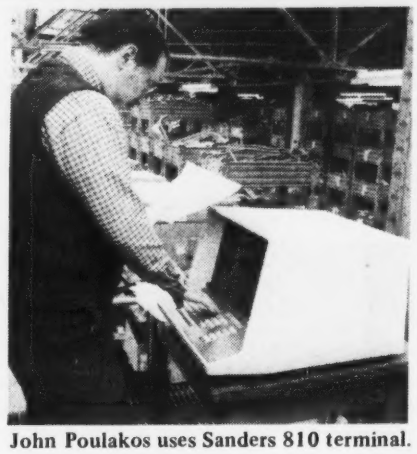
"A typical, smaller crane consists of 380 major components with up to 10 levels of assembly, and each assembly is comprised of from one to 20 parts," Poulakos said.

"The inventory system, via a bill of material, enables us to either 'explode' an assembly down to its smallest components or to start from the lowest level and work upward.

"This provides a complete parts list for a piece of equipment while creating an instant inventory in our computer files," he added.

Terminals located in the service parts department provide answers to some 60 to 70 telephone inquiries received each day. And the CRTs used in shop floor control keep track of production by auditing the movement of parts through the manufacturing cycle, as well as the type and number of machines at each of

(Continued on Page 21)



John Poulakos uses Sanders 810 terminal.

Emulators Let Novas, Eclipses Work as 360/370 RJE Terminals

SOUTHBORO, Mass. – Two data communications programs that enable its computers to act as remote job entry (RJE) terminals for IBM 360/370 computers have been announced by Data General Corp. (DG).

The IBM 2780 emulator and the higher performance IBM Hasp workstation emulator with multileaving and interleaving can communicate with an IBM or DG CPU. Both programs run under full control of DG's real-time operating system (RTOS) and real-time disk-based operating system (RDOS).

The 2780 and Hasp emulators can perform RJE processing in a foreground mode, while Basic, Fortran compilation or application programs can execute in the background. Data files can be transferred to another computer by using Fortran calls to the system's bisynchronous driver, DG said.

The Hasp software, written for DG's recently announced Eclipse computer, requires 16K words of memory to run under RTOS and 24K words to run under RDOS.

-When communicating with a 360 or 370, Hasp emulates an IBM Hasp RJE workstation. It features full multileaving of up to seven input and seven output data streams for maximum use of multiple devices, data block interleaving and data compression for efficient data transmission.

Hasp operates with disk and magnetic tape peripherals in addition to video displays, card readers and line printers, DG said.

For Nova or Eclipse users, the 2780 emulation program operates in the same fashion as the Eclipse Hasp software. It can run under control of RTOS and RDOS and can communicate on a point-to-point basis with a 360 or 370 or with any other 2780 or Hasp-equipped DG mini.

The 2780 and Hasp programs are free of charge when ordered with necessary system hardware to form a remote intelligent processing system. They can be added at no cost to existing installations. Both emulators are currently available.

Vadic Bell-Compatible Modems Include Detection Techniques

MOUNTAIN VIEW, Calif. – A series of Bell-compatible data modems designed to operate at 2,400 bit/sec over dial-up or private lines has been introduced by The Vadic Corp.

The VA2400 series incorporates detection techniques that are said to improve modem performance and enable carrier acquisition over worst-case lines.

The VA2405A, C and D models are designed for operation over the dial-up network and are compatible with Bell 201C configurations. Automatic dialing is available with the VA801.

For private line applications, Vadic's VA2405G and K are compatible with Bell 201B units and provide transmission at 2,400 bit/sec over two-wire (VA2405K) or four-wire (VA2405G) telephone circuits. Both models are available for use in point-to-point or multidrop applications.

All VA2400 modems fit into the firm's standard stand-alone or multiple data set housings and incorporate diagnostics and displays. For example, address selection circuits provide terminal interface display of Transmit Data, Receive Data, Request To Send, Clear To Send, Data Set Ready and Carrier Detect.

Cmos circuits are used to minimize power consumption, making the modem suited for incorporation inside remote terminals or data communications systems, the company said.

Prices of VA2400 series start at $800 from Vadic at 505 East Middlefield Road, 94040.

Appeals Court Upholds FCC Okay Of Specialized Common Carriers

By Ronald A. Frank
Of the CW Staff

SAN FRANCISCO – The Federal Communications Commission (FCC) was duly authorized to make its now-famous ruling in favor of the specialized common carriers.

This was the finding of the U.S. Court of Appeals here after a two-year challenge brought by the National Association of Regulatory Utility Commissioners (Naruc) and the Washington Utilities and Transportation Commission.

Much of the decision of the appeals court was devoted to complicated questions on whether the FCC had the authority and jurisdiction to make the decision which established the specialized carriers such as MCI, Data Transmission Co. (Datran), Southern Pacific, etc.

An attorney for Naruc said "the decision failed to take proper account of developments that occurred since the appeal was argued" in 1973. A petition for a rehearing has been filed with the same court by Naruc based, in part, on the fact that the FCC has recently instituted a proceeding which includes an examination of the economic impact of the specialized carriers.

This type of investigation should properly have preceded the original FCC decision, the Naruc attorney said.

The petition for rehearing, if considered valid by the court, could result in the intervenors being required to file a reply. The intervenors in the case are Datran, the National Retail Merchants Association, MCI, the Computer and Business Equipment Manufacturers Association (Cbema), Nebraska Consolidated Communications, Interdata Communications, Southern Pacific and Western Tele-Communications.

An MCI spokesnam said the Naruc petition failed to bring up any new points. "The points were raised earlier in a petition for remand which the court rejected," the spokesman said.

In answer to the Naruc claim that the FCC is now planning to investigate the economic aspects of the specialized carriers, the MCI spokesman said that this proceeding, Docket 20003, deals mainly with the economic issues raised by the use of noncarrier equipment and not primarily with the specialized carriers.

"Bell and all the other parties had ample opportunity to bring up the relevant issues between 1963 and 1971. The FCC did study the important issues before it made its fundamental decision," the MCI spokesman added.

"The courts have upheld the authority of the FCC in this matter time after time; the other side sought to overturn the decision on some technicality and they failed," he said.

The Naruc attorney said the regulatory organization would continue to explore all legal avenues available to get reconsideration of the court ruling.

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SARAH ALLEN is

an independent consultant specializing in teleprocessing systems, on-line/real-time systems, message-switching systems and store-and-forward systems. Prior to forming her own consulting practice, Ms. Allen was a Director of Projects for Programming Methods, a subsidiary of GT&E. In one of her last major assignments, she was Project Manager for the design, development and Phase I implementation of a message-switching, front-end system for a major railroad; the system involved a TEMPO processor serving as a front-end for duplexed 370/155s, as well as 300 communication lines ranging from 55 baud asynchronous to 9600 baud synchronous. She also directed the design and implementation of a store-and-forward system for a major communications company; this system allows any TELEX subscriber the capability of having his messages held in an auxiliary computer system for subsequent automatic re-transmission to a foreign TELEX number, using a combination of several independent RCA-1600 subsystems.

Ms. Allen was also responsible for the design, development and implementation of an automatic refile system which processed all messages rejected by the computerized telegraph system of a major communications company. This included all error analysis of messages, reformatting of erroneous messages, and transmission of unroutable messages to a system that scanned and deciphered customer city addresses, using principles of natural language translation. As an extension of this system, she designed and implemented an automatic dialing system to interface with specially designed computer hardware which can perform the dial-out function for private tie-line customers. This system performs the necessary message processing, and then automatically transmits the message to the customer, instead of sending the message to a branch terminal.

Earlier in her career, Ms. Allen designed and implemented a number of numerical analysis applications on the IBM 7094; designed and implemented the maintenance and posting run of a large credit card system on an IBM 360/40; developed the hardware and system design specifications for the conversion of an IBM 1401 credit card system to a 360/50 with optical scanning input devices and on-line inquiry response capabilities; developed an on-line file maintenance and order shipment status system to be used with IBM 2260 terminals; implemented numerous commercial applications using COBOL on the H200 computer; and participated in a generalized program to predict future needs for outside plant equipment at Bell Labs.

Ms. Allen has a B.A. in Mathematics from Vassar College, is a member of Phi Beta Kappa, and was awarded a Fullbright Scholarship. In addition, she has an M.S. in Mathematics from Rutgers University, where she has taught undergraduate mathematics courses.

TELEPROCESSING SYSTEMS DESIGN

Introduction—Components of a teleprocessing system: terminals, modems, the telecommunications network, the central site. Type of teleprocessing systems: message-switching, on-line inquiry systems, transaction processing systems, remote batch systems, time-sharing systems, data acquisition systems.

Systems Architectures for Teleprocessing Systems—Message-switching systems. Front-end systems. Data concentrator systems. Store-and-forward systems.

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Tools for Analyzing Teleprocessing Systems—Analytical models. Simulations of teleprocessing systems. Queueing theory, statistics, combinatorial probabilities.

Systems Design of the Transmission Subsystem—Terminals and their transmission characteristics. Multiplexing and concentrators. Microprogrammable processors. The telecommunications medium: code sets, control codes, message formats, line disciplines.

Distributed Network Design—WATS lines, Dial-up lines, leased lines, Telpak lines. Network topology and structures. Common carrier services and tariffs. Centralized versus decentralized networks.

Implementing the Teleprocessing System—Coordination between the design team and the implementation team. Definition of system interfaces. Development of system integration and system test plans. Establishing plans for support personnel, vendor interfaces, support and maintenance of the system. Establishing standards, procedures and documentation for teleprocessing systems.

Software for Teleprocessing Systems—The use of telecommunications packages in a teleprocessing system: IMS/DC, INTERCOMM, ENVIRON/1, CICS, TASK/MASTER etc. The use of telecommunications macro languages in teleprocessing systems: BTAM, QTAM, TCAM, etc. Understanding real-time software principles: software schedulers, priority interrupt handling, buffer management, table-driven software, reentrant software, queueing strategies, etc.

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Common Carriers and Regulatory Agencies—Federal tariffs. State tariffs. The Bell Telephone companies, Western Union, MCI, Datran, and other communications vendors. Interconnections between the common carriers.

Types of Telecommunications Service—Low-speed lines. Medium-speed voice-grade lines. Broad-band lines. Half duplex/full duplex lines. Private lines versus switched lines. TWX and Telex lines. WATS lines. Synchronous and asynchronous transmission.

Data Codes and Message Formats—Baudot codes, BCD, EBCDIC, ASCII, Hollerith, other codes. Special characters, control characters, synchronizing characters. Message headers, message addressing, message trailers.

Communications Media—Modulation techniques. Characteristics of communication channels. Data sets and modems. Industry interface standards. Line protocols: uncontrolled, controlled, polling, ACK/NACK logic.

Telecommunication Errors—Causes of telecommunication errors. Frequency of telecommunication errors. Echo-check strategies. Parity checking by character and by message, or by block. Cyclical redundancy codes (CRC) and other complex error-checking codes. Error detection versus error correction.

Telecommunication Networks—Dedicated networks. Dial-up networks. Multiplexed networks: time-division multiplexing (TDM) and frequency-division multiplexing (FDM). Data concentrators, networks involving minicomputers and satellite processing systems.

Terminal Devices in Telecommunication Systems—Low-speed teletypewriters devices. Medium-speed thermal printing teletypewriter devices. CRT devices. Auxiliary storage for terminals: tape cassettes, floppy disks, etc. RJE terminals, OCR terminals, programmable terminals, and other special types. Future trends in terminals.

Central Site Hardware—The CPU and its influence on the telecommunication system. Peripheral devices. Data set adaptors and other interface equipment.

Software for Telecommunications—Using telecommunications "packages": IMS/DC, INTERCOMM, ENVIRON/1, TASK/MASTER, CICS, etc. Using telecommunications macro languages: BTAM, QTAM, VTAM, TCAM, NCP and others. Understanding real-time software principles: interrupt handling, buffer management, table-driven software, reentrant software, queueing strategies, etc.

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'Smartt' Programs Tab Telephone Use

NEW YORK – By selling its in-house-developed Systems for Managing, Analyzing and Routing Telephone Traffic (Smartt), a telecommunications traffic engineering firm here has effectively become a service bureau to other consultants.

Using a concept of computer management and analysis, Computoll Corp.'s Smartt programs are designed to reduce long distance and/or message unit telephone costs by pinpointing the lowest cost, reduced rate lines available from the telephone company.

The company noted that analysis takes place and solutions are derived within the framework of a customer's system.

Among the programs available through Smartt is the Cash Flow Analysis program which, the firm said, analyzes the costs and rate of return of various nontelephone company-manufactured telephone systems when measured against those of the telephone company.

In addition to this comparative program, another technique, the Smartt-Toll Study, takes the corporate client's list of itemized long-distance telephone calls, arranges them in sequence by area code and exchange, looks at the calls by hour of the day and then presents the client with a graphically displayed summary of the data, the vendor explained.

While the toll study provides documentation in support of recommendations, Smartt-Wats analyzes a client's Wats charges (wholesale rate), prices the calls as toll charges (retail rate) and then compares the cost effectiveness of these two services.

Computoll said this program permits the merging of calls as if they were toll calls so the optimum system of Wats can be redesigned.

Combining the information accumulated through Smartt-Toll and Smartt-Wats, the Smartt Opti-Wats program is said to construct low cost/best service reduced rate line configurations for implementation.

This program assumes "zero delay," the firm explained; as soon as the call is placed, it goes through by whatever line is recommended – tie-line, foreign exchange, Wats or toll.

If the corporate client can afford to have some calls wait, Computoll has the Smartt Opti-Queue program which assumes that certain calls which should go out on Wats can wait until the lines become free.

Retail rates for its programs are as follows: Cash Flow Analysis, $150; Toll Study, $200 to set up system, then 4 cents per call up to 10,000 calls and 2 cents per call over 10,000 calls; Wats, $200 for analysis of the first line and $100 for each additional line; Opti-Wats, 5 cents per call and 2 cents per call over 10,000 calls; and Opti-Queue, 8 cents per call.

Further information on these programs can be obtained by contacting the firm at 75 Rockefeller Plaza, 10019.

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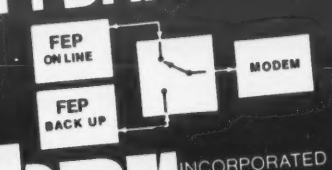

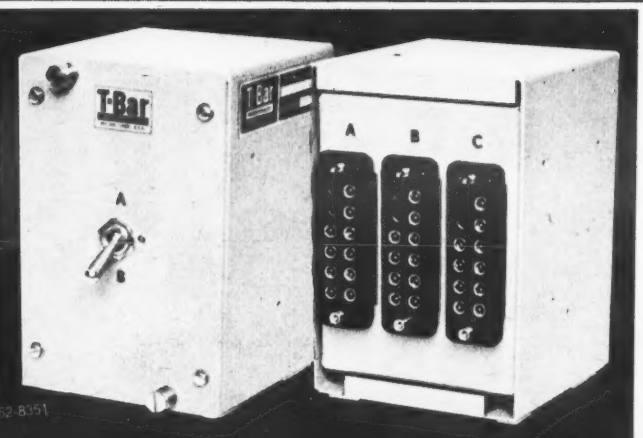

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CRT Access Gives Manufacturer Control of Inventory

(Continued from Page 19)

the 300 work centers, Poulakos noted.

In addition, the system has been expanded to include labor reporting and management information, generating labor force reports on some 400 employees and permitting Koehring to more easily adjust and vary costs along with calculating lead times for production.

Running under OS/VS, the CRT system depends on some 225 programs centered around inventory control and written by Koehring's four-person programming staff over the last year. The terminal network represents "our first jump into on-line applications," Poulakos said.

The response from employees relying on the system has been good so far – particularly in the manufacturing environments, according to the programming manager.

New Applications

With no more than an on-line training package explaining the use of the keyboard and procedures for gaining access to certain information, "these people have discovered new applications while the DP department was still programming them," he said.

Poulakos indicated he would appreciate a similar speed from IBM in servicing Koehring's CRT system.

"If we had gone with a 3270-type terminal, rather than CRTs like the 2260s, we probably would have much better service support from our mainframe vendor," he said.

IBM's inattention to 2260-like devices, such as the Sanders 810s, tends to make things difficult for a small programming staff, he commented.

Adding to these difficulties, Poulakos noted the company's 240K mainframe is currently overloaded in its efforts to support five partitions, several remote job entry terminals and the 16 CRTs.

"The result is that the response time on the terminals is very bad," he stated. "Response time varies anywhere from eight to 40 seconds when it should be about three seconds."

He noted, however, that when the CRTs are running alone on the CPU the response time drops to under three seconds.

In the next year, Koehring plans either to upgrade the core on its present machine to 512K or to acquire a 370/145 with a 384K memory. In either case, the number of CRTs used by the company will double, Poulakos commented.

The enthusiasm of its user departments and the encouragement of Koehring's management has led the DP department to construct plans for a complete on-line order entry system with inventory control and stock replenishment features.

Similarly, an engineering change notice system will eventually be installed that will make information pertaining to all running changes and replacements of parts immediately available to users, Poulakos said.

"An excess inventory of $26 million, however, has necessitated that we temporarily set these plans aside in favor of an on-line purchase entry system," he added.

Poulakos also remarked that user departments have started to use the CRTs for data entry to replace keypunching.

Eventually, Koehring expects to install a similar CRT inventory control system at its plant in Chattanooga, Tenn. and to use data communications to centralize those systems and others within the company at one or two sites in Milwaukee, Poulakos said.

NCR 255 Gets Retail Capability

DAYTON, Ohio – NCR has upgraded its 255 supermarket terminal system by adding retail store capabilities.

Called the 255 mass retailing system, the enhanced version is designed for operation in "hypermarket" stores, which offer both food and general merchandise through the same checkout lanes.

Among the added features are data collection hardware which depends on the amount of sales transaction data to be stored. Either dual cassette or 9-track 800 bit/in. tape handlers can be added to the system.

With the transaction storage, the system can be polled after store hours to transmit batched data to a central DP site over dial-up or private lines.

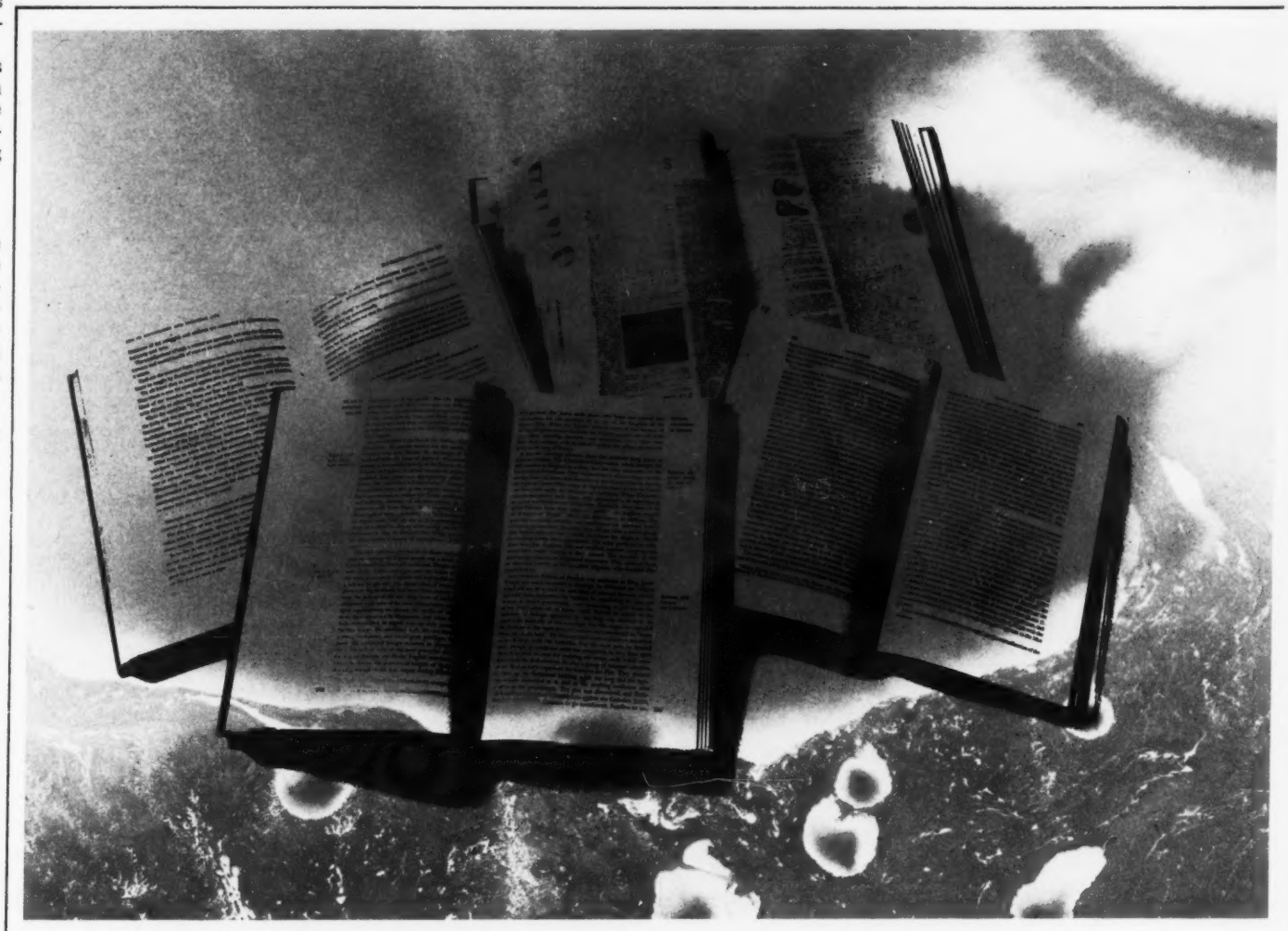
Software that has been added includes the capability to monitor inventory levels using Stock-keeping Units (SKU) and such terminal features as layaway transaction accounting.

The 255 system can handle up to 32 checkout terminals which can be equipped with Universal Product Code (UPC) scanners, OCR-A wand readers or Codabar readers for reading price tags.

The price of a typical system for a discount store with 10 checkout lanes is approximately $60,000. The price per terminal ranges from $2,945 to $3,245, depending on printing capabilities.

Future releases of 255 system software will include expanded communications functions, random-access file capabilities, back-office data capture and additional point-of-service features.

The mass retailing version of the 255 has been pilot-tested in a discount store, a hypermarket and a drugstore. Customer deliveries will begin immediately.



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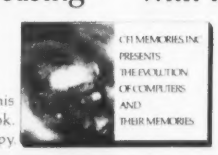

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Adds Consul 980A Replaces IBM 3270 CRTs

HAUPPAUGE, N.Y. – Applied Digital Data Systems, Inc. (Adds) has introduced an addition to its line of CRT terminals.

Called the Consul 980A, the terminal is intended to operate in an IBM binary synchronous communications environment at speeds up to 9,600 bit/sec.

Among the terminal's standard features are extensive local editing controls, protected/variable format control, upper/lower case character display, a patented graphics capability, a local printer peripheral interface, an audible alarm and a security keylock, according to the vendor.

The 980A is an alternative to the IBM 3270 CRT even though it is not plug-to-plug compatible with the IBM 3271/3277 and 3275 terminals. It is, however, 3270 communications-compatible and is supported by all current IBM telecommunications access methods (Btam, Tcam, etc.) and by such real-time monitors as CICS.

In addition, the 980A can be multidropped on the same communications line with other binary synchronous communications terminals, such as the IBM 3270, 2780 and 3780, the company said.

The terminal is provided with an EIA RS-232C interface operating in half-duplex mode. It transmits in Ascii code at speeds of 2,000-, 2,400-, 4,800- and 9,600 bit/sec.

The 980A displays data in a 24-line, 80-char./line format, providing a total of 1,920 displayable characters. Legibility is achieved by displaying black characters on a white background.

Formatting Features

A formatting feature permits the simultaneous display of fixed (half-intensity or gray), blinking or variable data characters. Utilizing the data entry and editing features such as line or character insert and delete and tabbing, the operator can then fill in the blank spaces with variable data, displayed as black character.

Upon transmission, only the variable data is sent to the CPU.

Using a resolution of approximately 12,000 elements, a graphics feature allows the 980A to draw crisply defined graphs, Adds said. Each graphical element is a small rectangle which occupies one-sixth the area of a normal character.

The 980A can perform several additional functions. An audible alarm is available to notify the terminal operator the computer has a message.

Another feature which allows the computer to read the current cursor position of the terminal is also standard.

A 100 char./sec, 80- or 132-column serial dot matrix impact printer will be available as a peripheral option to the 980A. The printer will include such features as vertical format control, audible alarm, upper/lower case character set, automatic motor control, printer stand and receiving tray and a tractor feed capable of handling multipart forms.

The 980A will be installed and serviced by NCR's field engineering organization.

Price of the 980A is $3,200 or $90/mo on a three-year lease/purchase agreement. Deliveries of the terminal will begin in June from 100 Marcus Blvd., 11787.

Terminal Transactions

Idaho Law Enforcement Facility Ups Capabilities With 'Telecontroller'

DALLAS – The Idaho Department of Law Enforcement recently upgraded its data communications capabilities with the installation of an Action Communication Systems Telecontroller.

The system monitors and handles all communications, on a local, state and national level for the department's 55 Model 35 Teletypes operating at 100 bit/sec and three Data Speed 40 CRT terminals which operate at 1,200 bit/sec.

National Messages

In addition to terminal locations around the state, the processor also handles messages and queries to and from the National Crime Information Center (NCIC) and the National Law Enforcement Telecommunications Systems (Nlets).

The Idaho processor has a diagnostic line monitor that enables a control operator to monitor communication lines and diagnose and localize problems more efficiently and completely. It also acts as an input terminal to display all messages stored due to terminal failure.

Another feature installed on the Idaho processor is automatic routing. This converts terminal addresses of messages received from Nlets from nine to four digits, which allows their routing without operator intervention.

Prior to the installation of the front end, Idaho was using a manual dial-up system to handle terminals around the state and an off-line tape system to Nlets.

Kaye Alphanumeric Badge Reader Transmits Full Ascii Character Set

STAMFORD, Conn. – Kaye Technology Group has announced an alphanumeric conversational badge reading terminal which transmits the full Ascii character set and the contents of a standard Type 3 badge. The terminal displays characters received on a 32-position dot matrix display.

When a badge is inserted, a special character is transmitted denoting the start of the badge read cycle. Up to six columns will automatically be read from the badge and the special character is again transmitted, signalling the end of the cycle.

Display Always Active

The keyboard is active only when the badge is in place; the display is active at all times, the vendor said.

The terminal is suited for job cost control, payroll, inventory control or any activity where the badge contents may be used to determine the destination file for information entered on the keyboard, the company said.

The terminal costs $3,200 from 943 Hope St., 06907.

Controller Fits Diablo Printers

MELROSE, Mass. – Interface Corp. has a controller that enables a Diablo Hytype I printer to receive and print Ascii data transmitted over any RS-232 or current loop interface.

Called the HT-100, the buffered microprocessor controller can operate at speeds from 110- to 9,600 bit/sec. It comes complete with a printer cable, power supply cable and communications connector for $1,000 from 192 Green St., 02176.

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COMPUTERWORLD

Adds Communications Options

Burroughs Doubles B700 Line

By Vic Farmer
Of the CW Staff

DETROIT – Burroughs Corp. has doubled the number of packaged systems in its B700 business-oriented minicomputer systems, and in doing so it has added communications options, integrated a Cobol compiler, IBM-compatible floppy disks and two Micr reader/sorters.

The six models – B702, B704, B709, B713, B721 and B723 – all use Burroughs' B711 CPU, announced in 1973.

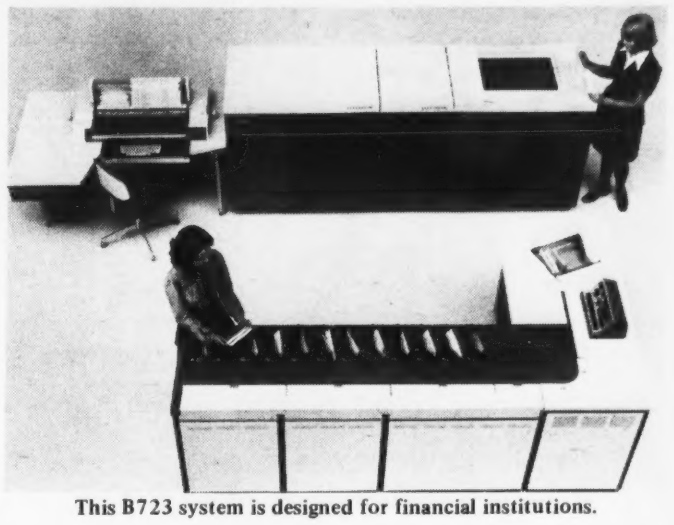
The B702, B704, B709 and B713 are said to be entry-level machines similar in power to IBM's System/32 and range in price from $33,900 to $54,900, with leases of $860/mo to $1,515/mo on a one-year lease.

The B721 and B723 are the most powerful members of the B700 series. The B721 is designed for general applications and the B723 is oriented to financial institutions. These machines are in the IBM System/3 Model 8 league, Burroughs said.

The B721 is priced from $62,350 to $70,250 (leasing from $1,593/mo to $1,851/mo) and the B723 ranges from $105,000 to $132,580 (leasing from $2,350/mo to $3,214/mo).

The B720's CPU has up to 11 I/O controls that are fully buffered and MOS main memory with a speed of one μsec for two bytes of data.

Main memory capacity can be expanded from the basic 32K bytes to 96K bytes in 8K-byte increments.



This B723 system is designed for financial institutions.

Peripherals and Subsystems

Peripherals and subsystems available with B720s, according to Burroughs, include:

- Up to four magnetic tape cassette stations.
- IBM-compatible tape drives.
- Line printers operating at 85-, 160-, 250- and 400 line/min.
- 96- and 80-column punched card equipment.
- Punched paper tape devices.
- TD 700 and TD 800 input and CRT display systems.
- A disk cartridge subsystem with removable cartridges that has a new disk controller which allows transfer of information between disk and main memory without processor intervention, increasing system efficiency.
- IBM-compatible floppy disk.
- Two Micr reader/sorters, each with a choice of 8 or 12 pockets, 600- or 900 document/min.
- A data communications processor module, which operates simultaneously with and independently of the central processor. The module has asynchronous and synchronous transmission capabilities with line speeds ranging from 75- to 9,600 bit/sec over four lines.

The data communications processor is programmed with Network Definition Language (NDL). NDL is compiler-based and permits each user to define a custom network controller for his line and terminal network, the firm said.

Data Communications Options

The smaller B702, B704, B709 and B713 systems are more limited, but have data communications at line speeds of up to 9,600 bit/sec with other computers.

Core memory for these can range from 32K to 48K bytes.

The systems have a removable disk cartridge subsystem with a capacity of 4.6M bytes. Average access time for the B702, B704 and B709 is 150 msec (with an option of 80 msec) and is 80 msec for the B713.

As with the B720 series, the cartridges are removable, offering unlimited off-line storage, the firm noted.

Line Printers

The B702, B704 and B709 can have line printers operating at 85- or 160 line/min. The B713 is equipped with a line printer operating at 160 line/min. A 250 line/min. printer is also available for use on the B713.

The B709 has a single tape cassette station, and the B713 can have up to four stations.

The B702 is said to be designed specifically for entry of data through the keyboard for processing by application program products.

The B704, in addition, can be equipped with up to four TD 700 input and display terminals for data entry and for inquiry into the computer's data files.

The B709 is designed to accept data recorded on cassette tapes by a Burroughs AE 300 series audit entry (AE) data preparation system.

The B713, in addition to utilizing AE techniques, accepts input from punched card devices. The B713 basic system can be expanded to include all peripherals and subsystems previously released for B700 systems, the company said.

The systems, according to Burroughs, become productive immediately with Burroughs' library of Business Management System program products.

Bank Relocates IBM 1419s 1,000 Feet From Processor

By David N. Hicks
Special to Computerworld

HOUSTON – In July 1974, Bank of the Southwest (BSW) began operating three IBM 1419 reader/sorters, using standard DOS/VS direct control, at a distance of 1,000 feet from the CPU.

This was made possible by a combination of 2944 Model 1 and 2944 Model 2 channel extenders and Request for Price Quotation (RPQ) devices.

Previous to IBM's approval of this RPQ, the maximum distance for which IBM would approve and support 1419 operation under DOS was 100 feet.

In addition to two 1419s, the configuration was approved for two 3272 control units with up to 64 3277 display stations, two 2821s and two 1403 N1s.

Currently, the channel extender has three 1419s, two 2821s, two 1403 N1s and a 2540 card reader.

The equipment is located in the main bank building across the street from the data center and supports the total Micr entry function at the bank. The data captured through Micr is now immediately transferred to 3330 on-line disk drives in the main data center.

The net result of the operation is the ability to release a 64K 360/30, four 2311 disk drives, a 2841 disk controller, a 2415 tape unit and a card reader/punch.

The total cost of Micr hardware at BSW is now $13,427/mo, as opposed to the cost of $22,097/mo of the previous configuration.

Before the installation, the Model 30 and associated peripherals, including two 1419s, had been used to process the bank's proof of deposit and transit work.

Another 1419 was attached to a 370/145 in the main data center to process Micr for correspondent banks and to provide backup for the Model 30.

The internal work was carried from the Model 30 area to the main data center on tape after preliminary editing and balancing. The large volume of items to be fine-sorted was distributed between both areas to use the capacity of all sorters to meet deadlines.

This installation, in conjunction with the new Micr software developed jointly by IBM and BSW personnel, should significantly reduce the cost of Micr processing and enhance item processing activity at the bank.

The new software supports up to six 1419s on-line at the same time, each independent of the others; has restart capabilities; and has DOS subtasked, full-page printing capabilities and the necessary architecture for the addition of item addressing and on-line reject reentry and balancing.

Hicks is systems officer at BSW.

Scan-Data's Small OCR Reads Handprint Numbers

NORRISTOWN, Pa. – Scan-Data Corp.'s 2250/1 OCR system is said to be designed to meet the data input requirements of smaller volume computer installations.

Developed for the same user as the IBM 3886 OCR, the 2250/1 offers a multiprogramming operating system, flexible software and reject handling methods, Scan-Data said.

Lower Case Reading

It reads alphanumeric OCR-A and hand-printed numbers, and an optional feature provides OCR-A lower case reading.

The system handles full-size pages and small turnaround documents and reads data prepared by typewriters, line printers and pencils, the firm said.

The 2250/1 may also be integrated with the 2250/2 key entry system to provide mixed media capability. The integration of these systems eliminates redundant peripheral equipment, allows keyed data to be added to scanned data and provides for sight or key verification of data that cannot be logically verified by software edits, the firm said.

The system has a three-year lease price of $3,985/mo, including maintenance. Scan-Data is at 800 E. Main St., 19401.

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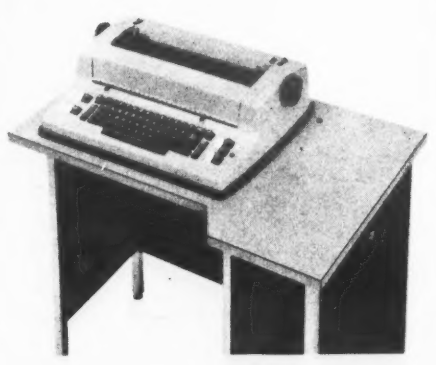

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Honeywell Announces: A New Series 60 Computer

Model 66/10 GCOS

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If you want upward compatibility that will let you move to a more powerful computer system without reprogramming, Series 60 and GCOS anticipate your needs. Model 66/10 puts you in the GCOS environment.

If your business needs all of this, in a system that is easy to program, easy to schedule, easy to control, and easy to maintain — you need the Honeywell Model 66/10.

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Small System Controls Bank's International Data Base

NEW YORK – Handling day-to-day transactions and money management for large clients is a major problem for bankers. Information must be readily available, and the information gap problem is usually solved by running some form of data base management system on-line.

But more and more bankers are trying to bridge the information gap by turning to dedicated minicomputer-based systems, either as an in-house substitute for a time-sharing service or as an on-site system for a small division or subsidiary of the firm located in a different part of the country.

One bank recently solved its on-line data management problems by selecting a small system from Singer.

In New York, the State Street Bank Boston International (SSBBI) subsidiary of the State Street Bank of Boston uses a Singer System Ten to help with decisions in international banking for its clients.

The system costs SSBBI $19,000 a year less than the next most logical alternative, which was an expansion of its prior accounting machine operation, according to the bank.

No Reliance on Intuition

"Our computer-produced monthly Account Performance and Profitability Report allows us to expand relationships based on mathematical facts, rather than overly relying on our intuition of an account's value," according to Nelson Ruiz, SSBBI assistant secretary.

The report includes a return on investment index (annual income divided by average annual expenses) as well as an effective rate of return (which gives credit to the bank for client deposits at a rate equal to the average prime rate) plus over 250 statistics on a current year and previous year basis for a composite picture of client or client-group status.

Prior to the installation of the System Ten, requests for similar information would be answered in two weeks, as opposed to the on-line conveyance of responses with SSBBI's CRT terminal.

The installation was preceded by a two and one half year study, headed by Ruiz, to find a more effective method of accommodating SSBBI's business, which was increasing SSBBI's assets by an average of 40% a year during that time.

"An integrated package of application software, developed by SSBBI, provides both accounting and analytical information by accounts and groups of accounts. A composite report of all a client's transactions, for example, not only tells what is owed us but what the profitability of a loan is in terms of expected vs. actual return," Ruiz said.

The $2,000/mo System Ten configuration has 20K characters of main memory, 8M characters of disk storage, a keyboard/printer, CRT terminal and 110 line/min printer.

Transactions are randomly entered into the system through the keyboard/printer. Hard-copy ledgers provide proof of entry.

Daily and Monthly Reports

Nightly, the central processor validates all transactions according to a series of programmed tests and strikes a trial balance of all assets and liabilities. Then an update program transfers all the day's activities into subsidiary ledger files, internally summarizes all interest earnings and interest expense accrued and updates a general ledger file, which is used to prepare fully consolidated statements of condition and income.

A more elaborate monthly update program produces the profitability reports by client and client groups: foreign banks, domestic banks, foreign corporations, domestic financially oriented and commercially oriented corporations.

The System Ten produces a daily statement of condition and income reflecting SSBBI's assets and liabilities and income to date as of the close of a previous day.

And SSBBI customers benefit, too. As a result of statistics gained from the system, services can be more accurately priced, in many cases making the bank more competitive. In addition, clients now receive full banking statements, reflecting all deposit and liability balances.

Miniworld

Dataram D-70 Plugs Into Varian Minis

CRANBURY, N.J. – The DR-70 "add-in" memory from Dataram Corp. plugs 8K or 16K of memory on a single board in the back panel of a Varian V-70 minicomputer, according to its vendor.

The firm said the DR-70 has several advantages over its Varian equivalent. The Varian's 16K, one-board system will not run at the 660 nsec of the 8K system, while both Dataram's 8K and 16K memories run at that speed.

The Varian 8K/16K, single-board system requires enough space so it effectively occupies two card slots, Dataram said, while the DR-70 needs only one card slot.

A 16K by 16-bit word single-port 660 nsec DR-70 costs $4,050 from the firm at Princeton-Hightstown Road, 08512.

Gerber Drafting Table Comes With HP 2100

SOUTH WINDSOR, Conn. – The Model 77 high-speed, large-area flatbed drafting table from Gerber Scientific Instrument Co. is an automatic drafting system that can plot at speeds up to 2,800 in./min with 1G acceleration, the firm said.

Plotting accuracy is ±.005 in. and repeatability is ± .002 in., the firm added.

The Model 77 system, which includes a Hewlett-Packard HP 2100 minicomputer, costs $94,000 from the firm at 83 Gerber Road, 06087.

3330 plug-compatible disk drives from Randolph

RCC/7330 disk drives provide IBM S/360 and IBM S/370 users with high performance at savings of 30% or more

Over eight thousand Model 7330 disk drives are running round-the-clock on S/360/50, 65 and S/370's throughout the U.S. They match the performance of IBM 3330 disk drives in every vital comparison except one—price.

The RCC/7330 disk drives offer Randolph customers saving of 30% or more, and you still get the same Storage Capacity of 100 million bytes per spindle, Transfer Rate of 806,000 bytes per second and Error Correction with automatic detection and retry.

RCC/7830 Storage Control Unit– key to high performance at low cost

- Plug-to-plug compatible with IBM's 3330 on S/370
- Connects to S/360/50 and S/360/65 via a selector channel
- Provides for control of one to sixty-four RCC/7330 disk drives, permitting incremental storage additions of 100 million bytes up to a 6.4 billion byte system
- Dual-port capability offers substantial advantages over string-switching to the multiple CPU and/or controller user by allowing simultaneous access to spindles in any system

RCC/7330 uses IBM 3336 or equivalent disk packs

Each pack is interchangeable on any RCC 7330 or IBM 3330 drive. Provides nineteen surfaces for data storage. The twentieth disk surface is used to control servo-seeking, track following, rotation-position sensing, and data clocking.

Do you have an IBM S/360/50, 65 or S/370?

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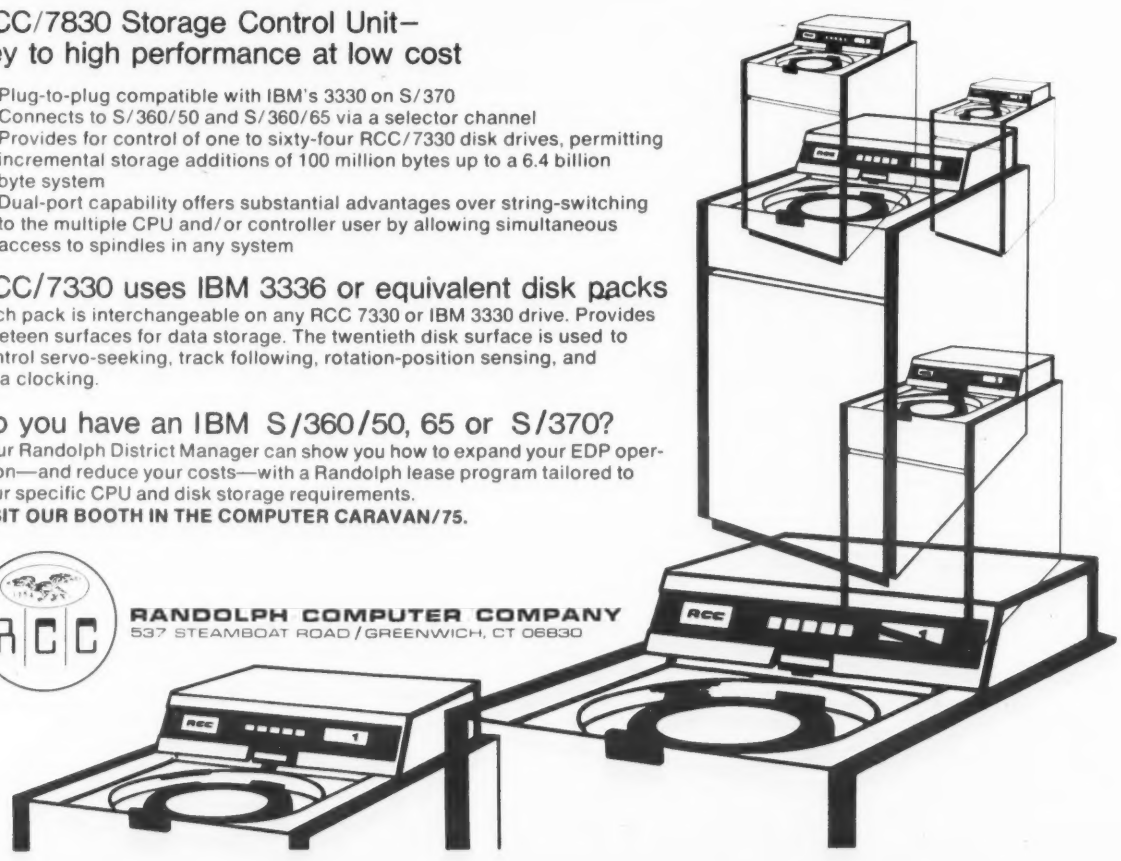

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Multipurpose System Slashes Printer's 'Timely' Data Worries

ZEBULON, N.C. – To satisfy its need for accurate job-cost data, Theo. Davis Sons, Inc., a medium-sized advertising and house magazine printer, was using a computer service bureau in Charlotte, some 150 miles away.

Though computing costs were high – the company was paying the bureau $400/mo for keypunching and the production of four job-cost analysis reports – alternatives were as expensive in either dollars or time.

The purchase and operation of a limited-memory computer was prohibitively expensive. Time-sharing on a nearby, large installation would save money, but the work would be run according to the job scheduling routine in the operating system.

Even with the service bureau, time was a problem, with average turnaround time of at least five days.

The urgency resulted from a basic report in the system – the completed job report, a listing of all time and materials applied to every job. Upon shipping a job, the report is attached to the job ticket and used as the basis for pricing.

Even after the return of the report from the service bureau, it was a day-long chore for the printer's bookkeeper to compute the taxes, type the invoices and post the customers' accounts.

Using the mails, the service bureau and manual typing, invoicing lagged as long as two weeks after the job was shipped, stretching cash return into six to 10 weeks.

Miniworld

To gain immediacy, the company decided to purchase its own minicomputer and settled on the NCR 399, which doubles as computer and bookeeping machine.

After installation and programming of the 399, the delay in invoicing was slashed to an average of one to two days after shipment, permitting the printer to have the invoice on the customer's desk the same day the completed job is received.

Job-cost and efficiency reporting, which was being done by the service bureau, were the first to be programmed. Accounting and payroll functions were added soon after.

Sorts Time Card Data

The basic input to the job-cost programs is a time card, filled out by each shop employee daily. Each operation and machine is numbered and, with this, the job ticket number and the ending time of each function, the employees prepare a complete listing of all work done that day.

For about three hours the following day, the 399 is used as a key-to-tape entry device, with the operator keying all information from the cards onto a tape cassette for storage.

Once the information is recorded, the operator programs the machine with a prerecorded program cassette, and the machine automatically sorts the data from the first tape into the proper files.

Also contributing to the processing is another listing from the shipping department of all jobs completed for the day.

When keyed into the appropriate programs, this information commands the machine to perform two functions: to sort and print out the completed job reports for all jobs shipped; and to update the 200- to 300-item work-in-process file, removing completed jobs from the active file.

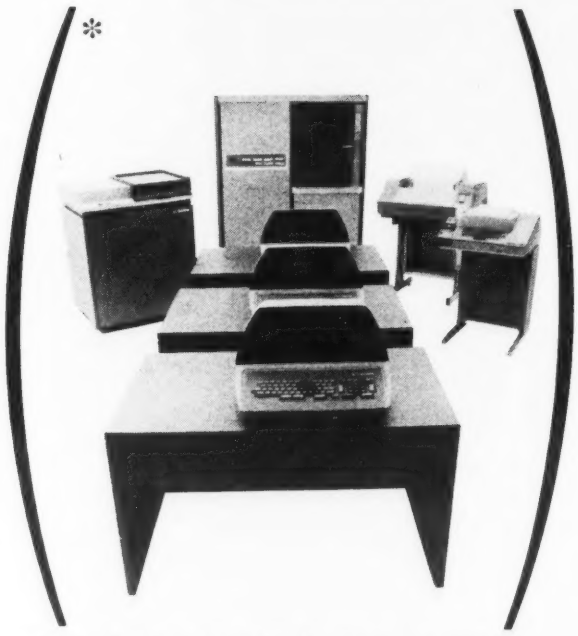
The machine then produces a daily exception report, showing all jobs on which the status has not changed within the last four days.

The bookkeeping operations formerly were done manually – normally requiring a 60-hour week for the bookkeeper just to keep up. Putting receivables, payroll and general-ledger through the service bureau, Potter noted, would have cost about another $1,300/mo. Doing it on the 399 saves the service fee, and the bookkeeper now is working a normal, 40-hour week.

Payroll used to take two to three hours just to calculate the amount due and another hour to type out the checks. The job now is done in 25 to 30 minutes.

The invoicing run, which formerly took a full day on the mechanical bookkeeping machine, now is completed in three to four hours.

GREAT COMPUTER SECRETS*



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The GCS 2100 is a complete data entry system: it lets you collect and edit data at the source (data is actually edited while it is being keyed); store the data on disc; then transfer the clean data to an output media like magnetic tape. (Data already on tape or cards can be re-submitted to the GCS 2100 for editing, reformatting, etc.)

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The GCS 2100 provides extensive I/O functions so you can transfer data to and from disc storage and other I/O devices.

The GCS 2100 can accommodate up to 64 local or remote terminals: local terminals can be located up to 2500 ft. from the system's CPU. You get faster, more accurate data entry for functions like payroll, shipping, receiving and manufacturing, because the person most familiar with the data does the keying.

The GCS 2100 also offers data entry from remote terminals (it can handle up to five remote terminals over one dedicated telephone line).

A Programmable Extension Package (PEP) extends the power and the flexibility of the 2100 system: up to 255 PEP tables provide capabilities like automatic data insertions; range and value checks; table look-ups; logical tests; character expansion; and data dependent format switching.

These tables are not job assigned, so they can be used on several different jobs.

A library of over 100 special edits is also available. (If there isn't an edit for your needs, we can design one.)

The GCS 2100 also provides up to 99 format levels per job; up to 255 balance accumulators; variable length record and blocking factors; and up to 255 jobs stored in the system.

GCS 2100 Peripherals: GCS DataTone — data entry via Touch-Tone* telephones. GCS Data Tel — remote batch communications.

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Systems Integration—Part 1

Complexity of Equipment Demands Careful Choice

By Randy L. Allen
Special to Computerworld

A computer system is not just a black box that accepts data at one end and issues answers from the other. Instead, it is a union of many complex pieces of hardware and software that are increasingly likely to come from a variety of vendors.

A retail store's point-of-sale system, for example, may rely on equipment from up to seven vendors, with seven vendor interfaces in hardware alone.

System complexities, multiple vendors and multiple vendor interfaces are all factors which require new methods and skills in system integration. These are especially important in the stages of planning, system selection, control, reporting and problem resolution.

At the start, a complete and firm set of system specifications gives a project a much better chance of ultimate success. Once the system specifications have been defined in detail, it is time to move into the planning stage.

Ideally, the DP group should start by defining the system requirements and their relationship to the total operation. These requirements should be well documented, with full explanations where there is a possibility of ambiguity. This data will be needed later during system design, selection and maintenance. Some sample requirements include:

- What types of computing systems, particularly software, are presently on hand?
- What language processor does the existing system use?
- What input and output media is planned for future use?
- What are the critical time constraints – now and later?
- How much backup or redundancy will be needed?
- Does the total operation require any special hardware, software or operating interfaces?
- How much and what kind of intermediate and permanent storage will be needed for programs and data?
- What are the minimum, average and maximum memory needs?
- Is a data base information system necessary? If so, what are the specifications for hardware, software and communications?
- Will on-line or polled operations be included? If so, what are the communications requirements?
- What new software is needed and when? Is the staff sufficient to accomplish the task?
- What facilities are available?

Our company has used the following approach successfully on several projects.

Once the go-ahead decision was made, a project manager was assigned. He assembled a team with the specialized skills needed to organize the project.

The team was manned full time by three people: the project manager, a representative of the systems programming staff and the systems operations manager. In addition, representatives from the technology, installation planning, equipment resources, finance and telecommunications organizations participated on the team as required.

Shortly after the team was selected, its members met at a central location and spent three days defining the tasks to be done and assigning responsible people. The result was a project document that established the specifications, requirements and organization necessary for the project's successful completion.

The document detailed what and who would be involved and the critical timing on the project. This visibility made it possible to obtain the required resources and staff. Incidentally, the team on this particular project successfully completed the task in three months.

System selection is another critical area in systems integration. Because the DP group does not always participate in system selection, it is important to exercise extreme care in this area.

And, while manufacturers know their own equipment, they are not always familiar with other vendors' hardware you may want to use with theirs.

In selecting software, which may include developing your own, it is wise to consider both present applications and those planned for the future. Otherwise, one may be forced into costly reprogramming later.

In most cases, in addition to knowing a particular area very well, team members have a basic understanding of the other areas as well as the total system. This knowledge, plus access to up-to-date reference material and an extensive library of manufacturers' literature, enables them to choose suitable candidate equipment. Then the team meets again to consider the alternatives and make the final selection.

Without cross-understanding, one can very easily end up with a mismatch; for example, a software package written in language X for vendor A equipment, while you have language X on vendor B equipment.

There are language standards, of course; however, transfer of software from one vendor's equipment to another's without conversion is still an impossible dream.

The matter of interfaces in system selection is of particular importance to the interactive-oriented user. There might be a requirement for a medium-speed remote printer and card reader with a particular print type and speed.

If your hardware expert doesn't understand how that device will communicate with the mainframe, you could be faced with an impressive piece of equipment but with no way to transfer data – perhaps because of different transmission speeds or data format. It has happened before and probably will again.

Part 2 will examine control systems integration project, reporting methods, problem solution and some possible ways to keep the project on schedule.

Allen is the retailing industry marketing manager at Boeing Computer Services, Inc.

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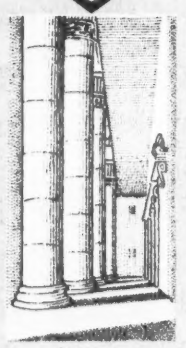

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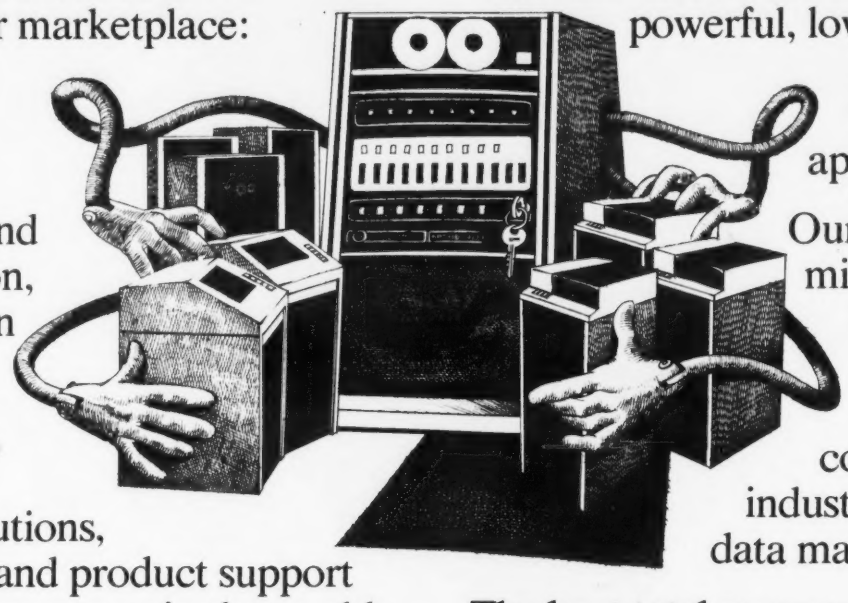


In these three areas, we offer a better package of total solutions, performance, price and product support than any computer company in the world.

No other computer company has worked so hard or dug so deep to understand the requirements of these three corners of the marketplace.

Involvement has always been our long suit.

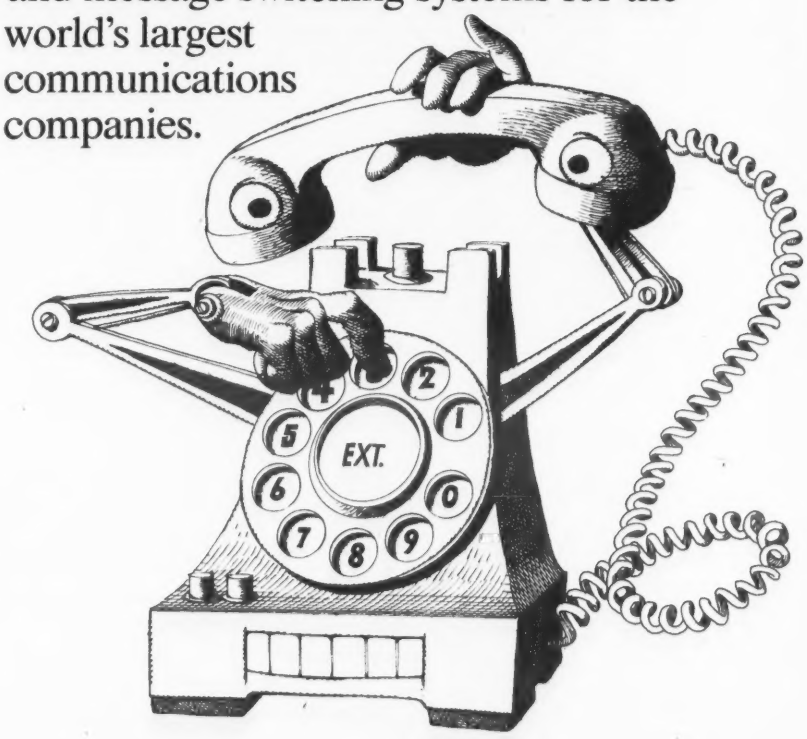
We've never favored the sell 'em and leave 'em end of the business. Which is why we're *not* number one in volume hardware sales. We think it's better to be the best specialist than the biggest generalist.

The most mini for the money.
A good example is our family of SPC-16 computers. Quite simply, they are the world's most powerful minicomputers. They do more work in less time with less memory than any other mini you could buy. As a result, we offer the least expensive solutions instead of the least expensive minicomputers.

Our SPC-16 family has helped a lot of OEMs and end-users build a lot of powerful, low-cost systems for a lot of tough, tight-budget applications.

Our family of mighty minis is also one of the primary reasons we offer so much capability in communications, industrial automation and data management systems.

The best total communications systems.
General Automation is the major supplier of minicomputers for PABX control systems, front end processors, Telex message systems and message switching systems for the world's largest communications companies.

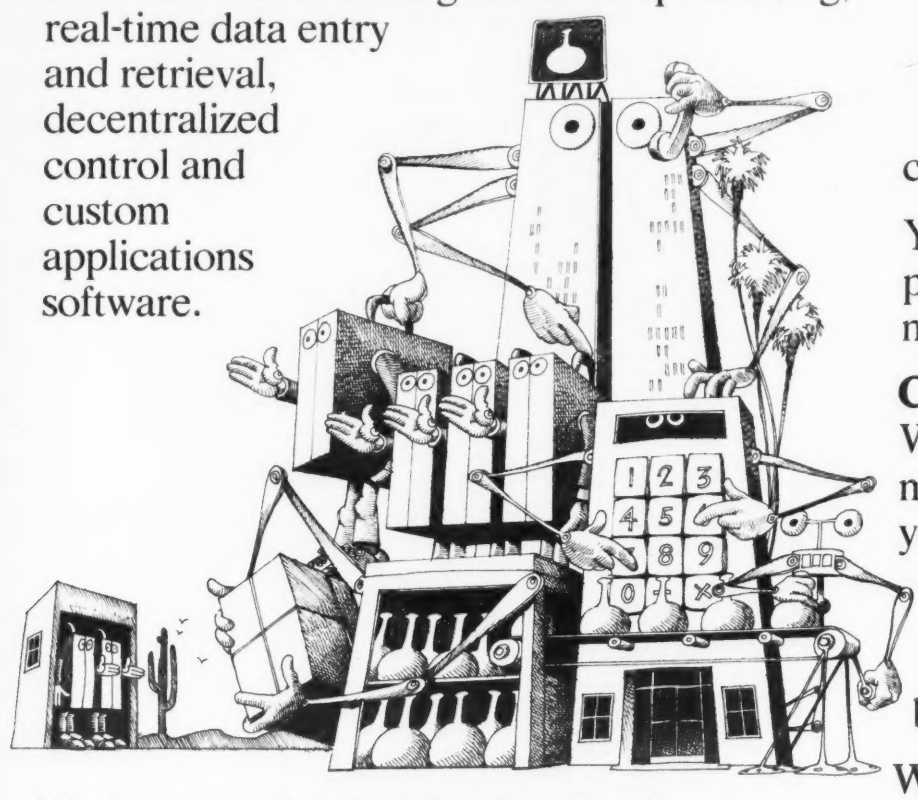


Our extensive experience has also made us the number one solver of tough problems for any company that needs a custom communications system.

If we can't solve your communications problem, nobody can.

The best total data management systems.
We can put you in better touch with your business by replacing a lot of time-consuming, non-productive status meetings, paperwork and guesswork with simple, automated systems that tell everyone who needs to know, everything they need to know, whenever they need to know it. No matter where they are or what they do or how they do it.

We can deliver a compatible, expandable, high-performance family of systems that can form a network offering batch data processing, real-time data entry and retrieval, decentralized control and custom applications software.



We have another family of on-line/batch systems that offers centralized control and a vast library of standard applications software.

In addition, we sell a low-cost, highly interactive turn-key system through distributors for companies that need economy more than system growth. And we manufacture the number one IBM 1130 replacement system.

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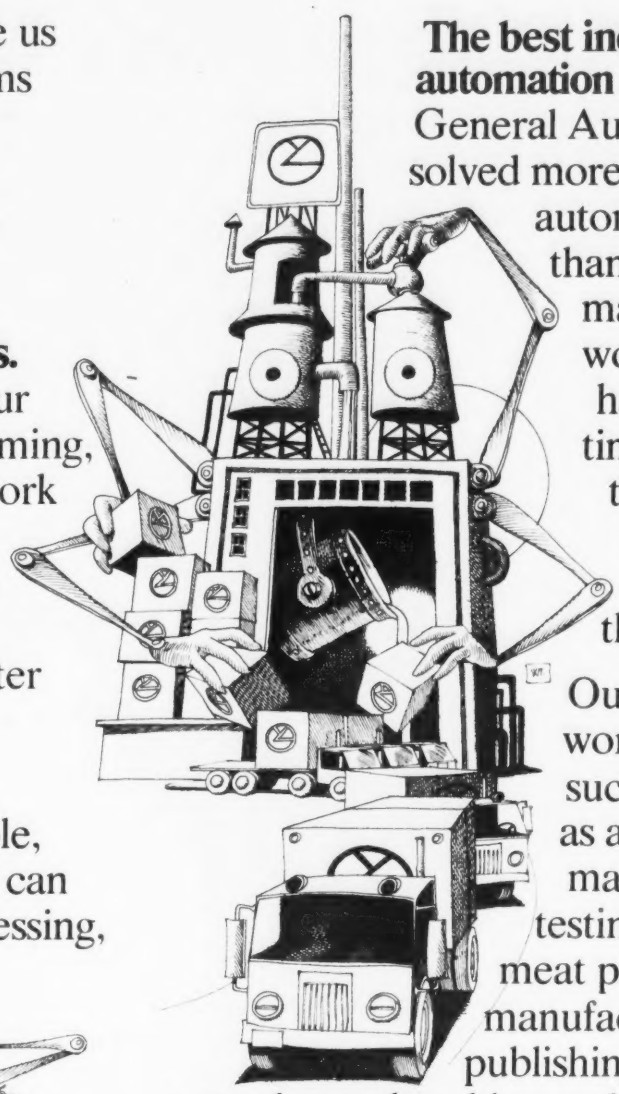

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IF WE CAN'T DO IT, NOBODY CAN.
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Real One 'Would Have Brought Standstill'

Fake Fire Strengthens Firm's Backup Protection Plan

By Jim Titus
Special to Computerworld

ELMIRA, N.Y. – "One morning I walked into the department and announced that the building had burned down the night before, we had taken our files and programs to someone else's IBM 1130 and we had a payroll to get out that day," recalled John Streeter, secretary of Streeter Associates, general contractors here.

Payroll sheets, checks, bid request cards, W-2 forms, punched tapes and other backup sources had theoretically been destroyed in the fire, and the job superintendent had discarded the time sheets.

"Worst of all, we had never tested our backup programs. We discovered that our source decks were reproduced wrong, which made the object decks wrong. Not a single program would have run.

"A real fire would have brought our entire data processing operation to a standstill," Streeter said.

Realizing the loss that could result from such a catastrophe, Streeter then began new procedures to protect his company's DP investment.

Forms and documentation were taken out of the computer room and stored in a vault. Superintendents were instructed to hold carbons of payroll records for a week on small jobs and for the duration of large jobs. Source programs and data files were copied in card form and stored in another building.

When the company shifted to an IBM System/3 Model 10 in 1973, Streeter ordered three extra disk packs specifically for copying programs and data. Instead of storing them in the vault, fire-rated for only 24 hours, he put them in a safe in another building.

He took home backup documentation. Should anything happen at night, backup disks could re-create the company's records as of 5 p.m. the preceding day and reconfigure a System/3 to his specifications.

The value of this protection was demonstrated last July when the wrong disk was initiated and the entire object library was lost. Operations were quickly resumed after the backup disk was brought in and copied.

But some changes in programming had not been backed up. This error resulted in Streeter's latest procedure.

Now, whenever a major change is made to a program, the disk is immediately copied. All changes, no matter how small, are logged on a record, with data, application and other pertinent information noted.

Report Series Helps Company 'Turn a Profit'

ELMIRA, N.Y. – "When we installed a computer in 1969 to keep up with an increase in business," said John Streeter, secretary of Streeter Associates, general contractors, "I suddenly realized that here was a tool that could tie all the company together."

The realization came at a critical time in the construction industry. In the years since then, rising costs, stiff competition and inflation have forced management to fine-tune their companies just to keep the doors open.

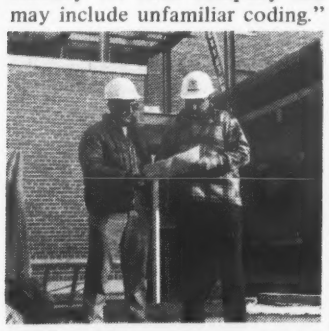
The DP department produces a series of management-prescribed reports that help Streeter turn a profit. A job costing report, for example, shrinks a massive amount of data on every job in progress to a one-line, attention-getting summary.

Problems spotted there turn company officers to backup reports on labor, materials or subcontractors for the specific details needed for corrective action.

In all, John Streeter has written more than 400 programs for two computers, an IBM 1130 and the current System/3 Model 10.

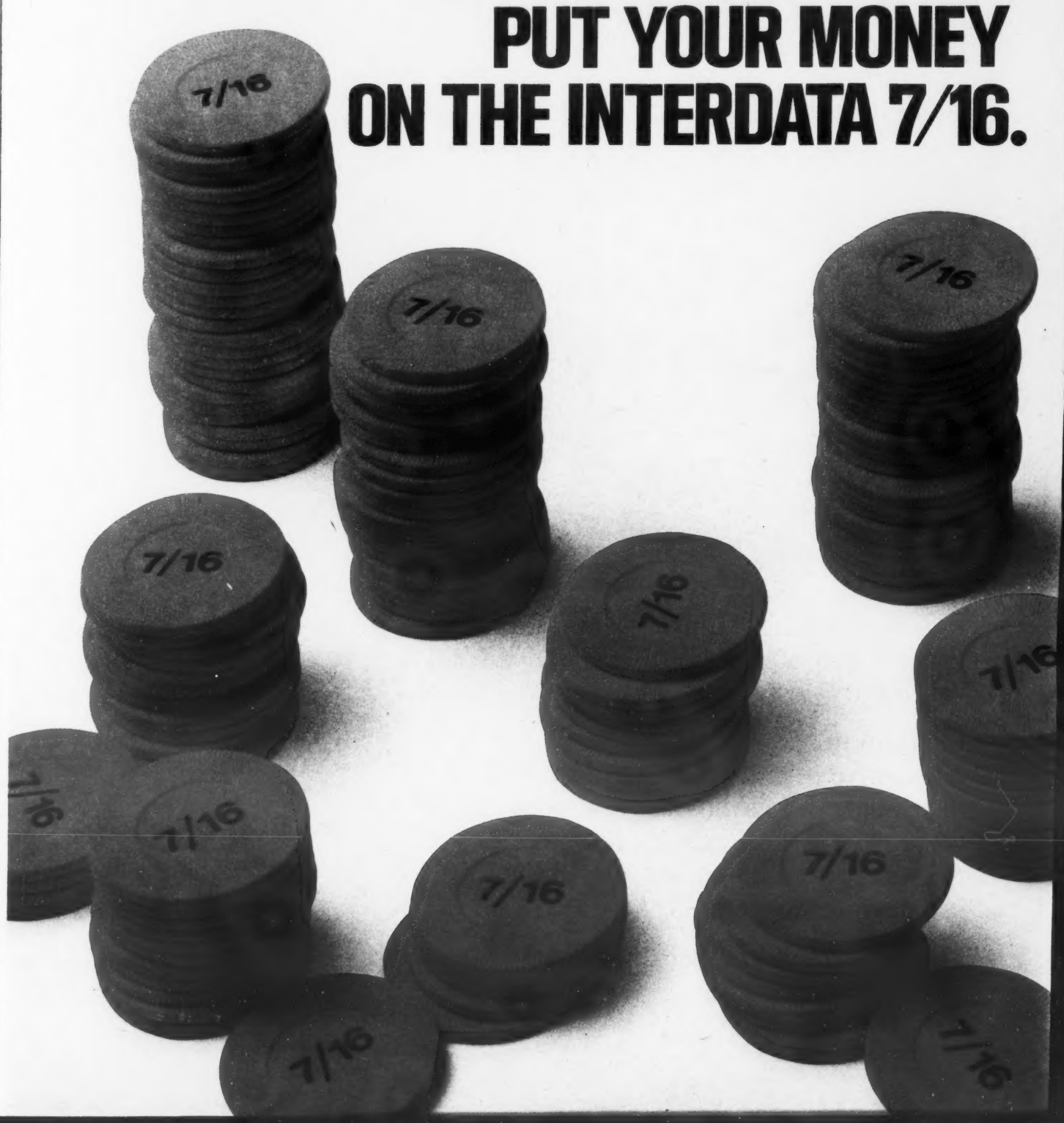
"Another contractor could buy a lot of application packages and possibly be where we are today in half the time it took us. But people in that company should realize that those packages will modify their business.

"It is critical that they learn what is inside those packages, because they are not written specifically for their company and may include unfamiliar coding."



Weekly labor cost summaries help Streeter's superintendent, Don Brown (right) spot problems on major jobs. Here he reviews unit costs of hospital expansion with the job superintendent.

WHEN THE CHIPS ARE DOWN ON MINICOMPUTERS, PUT YOUR MONEY ON THE INTERDATA 7/16.



Automated Payments Facilitate Antitrust Settlement

By Marvin Smalheiser
CW West Coast Bureau

SAN FRANCISCO – Payments resulting from settlement of a $67 million class action antitrust suit, which would have taken years to figure out manually, are being calculated on a computerized system in a few hours.

The suit charged that U.S. Gypsum, National Gypsum, Kaiser Gypsum, and Fibreboard Corp. had conspired to fix wallboard prices at some 20% above the competitive level.

The gypsum wallboard suit resulted in payments, including interest, to at least 65,000 persons and companies.

The payment system was developed by Computer Sciences Corp. (CSC), which established and maintained a file of claimants and created programs to test the validity of claims and make payments.

The job involved creating programs to flag implausible claims and search out duplicate filings.

Gathering the Data

Michael Kleinman, manager of CSC's San Francisco office and supervisor of the project, said the first stage centered on locating those persons who wanted to opt out of the settlement.

Then potential claimants – numbering 450,000 were sent an "extremely complicated instrument" to identify themselves and the amount of the claim."

"When the claims came back," Kleinman said, "putting them on the computer turned out to be a massive operation."

But once the information was on the computer, he said, it was possible to check the claims for validity, single out erroneous claims and pump out those that were not correct.

There was also a "huge file maintenance problem," he said, because a lot of the material was inadequate, and a large amount of correspondence took place between attorneys and claimants.

Job Split

The job was split two ways. The large file maintenance was done on an IBM 360/65 under OS in a batch mode.

But, certain information that had to be more accessible for modification and reference was pulled off on a subset and put onto CSC's Infonet system, where it could be handled conversationally from terminals in the office.

"Infonet enabled us to retrieve individual claim amounts very quickly from a terminal in the office," Kleinman said.

The programs involved were largely in Cobol for file maintenance and in Fortran for pay calculations, Kleinman said.

Five to 10 CSC programmers, analysts and supervisors spent five to six man-years on the job, Kleinman said.

"The programming was quite complex. There were a lot of numbers involved, and there were a lot of exception cases. It was complex, rather than difficult," he explained.

"The individual algorithm for paying off the fund is extremely complicated, and the single greatest advantage of the computer is that it makes it possible to pay off claimants in a complicated way appropriate to the settlement."

Settlements were based on complex mathematical formulas that determined how much wallboard was purchased from whom and what type of organization filed the claim.

Claims were also authenticated by programs that compared ratios among such items as the square feet of floor space, number of pounds of plaster used and the amount and dollar value of wallboard purchased.

Programs were developed to seek out similarities in claims and, in numerous instances, disclosed cases where cities and counties unwittingly filed for the same buildings.

At one point, the amounts claimed by a handful of organizations represented 2-1/2 times the total amount of wallboard manufactured in the U.S. during that period.

Auditors of the work, Kleinman said, have twice told the judge there are virtually no errors in the files.

Payments started in February 1974 and are continuing.

Program Aims At Botulism

NEW BRUNSWICK, N.J. – A Rutgers University professor has developed a program aimed at preventing botulism in canned foods and determining which nutrients and flavor qualities are lost during processing.

Prof. Ken-ichi Hayakawa's program, written in Fortran IV, is based on a mathematical procedure for heat process evaulation he developed in 1970. By combining heat penetration data with bacteria reaction kinetics, the technique tells food processors the temperature and length of time needed to can foods safely.

The time and temperature are dependent on several variables – the type of food being processed, acidity, thickness, initial cleanliness, size of the food chunks and can size.

"Using current procedures, it takes a technically trained worker close to an hour to make all these calculations," said Hayakawa.

"With a computer, it takes less than a second. The computer also eliminates human error, which can creep in when calculations of this length are made manually."

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To Advise on Best Treatment

Doctor Building Breast Cancer Data Bank

W. LAFAYETTE, Ind. – Doctors may one day use terminals linked to medical data banks to help them decide which treatment is best for a patient with breast cancer.

Dr. Edward A. Patrick, a medical doctor who is also a professor of electrical engineering at Purdue University, is working to apply pattern recognition techniques to the case histories of breast cancer patients which include information on the patients themselves, what treatment they received and how long they survived.

Patrick is collecting data on each patient's symptoms, results of lab tests, medical history, family history of breast cancer, whether she is in a pre- or post-menopausal state and other factors.

After this information is entered into the computer system, the set of procedures used on the patient and the length of survival will also be entered.

Eventually, this data base may be set up so doctors can key in a description of a patient and get advice on the probability of her survival for a particular number of years under a particular kind of treatment, Patrick said.

Medical doctors disagree on which kind of treatment is best for patients in particular stages of the disease. While some doctors habitually perform a radical mastectomy (removal of the breast and underlying chest wall muscles), others prefer the less drastic simple mastectomy (removal of the breast only) whenever they think it is a safe alternative.

Present data on survival rates for patients in particular stages of the disease receiving particular treatments is scattered and does not uniformly list patient characteristics, Patrick said.

Patrick has begun his research on a Digital Equipment Corp. PDP-11/45 using cancer data from the Indiana University Medical Center. He is also cooperating with doctors in Cincinnati and Pittsburgh.

Eventually, he said, "we would hope to establish a protocol that will be filled out for any woman who is receiving treatment or surgery for breast cancer."

While he has received money for his research effort, Patrick said he did not yet have funding for a computer-assisted consultation system on breast cancer.

It is not yet clear whether the system's cost would be borne by doctors, patients or the government, he mentioned.

But, Patrick said this kind of service is coming, not just for breast cancer but in other areas of computer-assisted diagnosis and consulting as well.

A breast cancer consulting service would be a good proving ground, since it would focus on a narrow subject where every doctor could use the same kind of information, Patrick said. This makes the problem of designing the system somewhat less complex, he added.

Canadian Pay Hikes Beat Inflation

By T.M. Whiteman
Special to Computerworld

TORONTO – Salary increases in 1974 exceeded the rate of inflation here, according to a survey on current trends in the Canadian DP industry.

The survey, which was prepared by the management consulting firm of Peat, Marwick & Partners, stated salaries increased by 13.5% in 1974, compared with a 10.9% increase in the consumer price index for the same period.

Some of this is a "catch-up" increase, the survey claimed. The 1973 study showed that the percent increase over 1972 figures had held at 5% to 6%, compared with an 8.5% increase in the consumer price index for that period.

The figures for both years contrast with the comparatively steady 4% average rate of increase in the consumer price index for the period 1966-1972.

The survey was national in scope and covered about 400 companies, institutions and governments representing some 8,000 employees and 29 position categories.

The survey revealed that senior managers had the highest rate of increase, 16.3%. All other positions increased by less – from 12.5% for functional heads and programmers to 13.1% for other personnel.

"Indications at this moment are that inflation will continue through 1975 at no less than the present rate," noted the report, "but not much higher.

"Salaries will probably continue to move up at about 12% to 15% on the average, with senior personnel most likely getting increases of a lower order than their subordinates."

The survey cited government and the resource industries as being the top-paying areas for the senior DP manager, closely followed by the utilities.

The report also underscored the current trend for more efficient and effective DP. "DP management . . . is looking into areas of centralization against decentralization of computer power," the report noted. "It is also looking at maxicomputers versus minicomputers, or a well-balanced mix of both."

Whatever direction DP activities take, the DP manager will be forced to resolve computer configuration questions and participate more actively in corporate strategy and financial planning. The report also noted that "in the area of maxi-, mini- or mixed computers, the DP manager will not only become concerned with hardware and software costs, but also with technical support for both, especially in the area of minicomputers where costs are attractive, but software and technical support are at times questionable."

'Diction-Wary' System Sifts Threats

SYRACUSE, N.Y. – Public and private organizations may soon use computers to determine whether bomb threats are terrorist plots – or just sick jokes.

Murray S. Miron, a psycholinguistics professor at Syracuse University, is working on a "computerized semantics dictionary" to help authorities quickly decide appropriate courses of action for the staggering number of bomb threats posed annually.

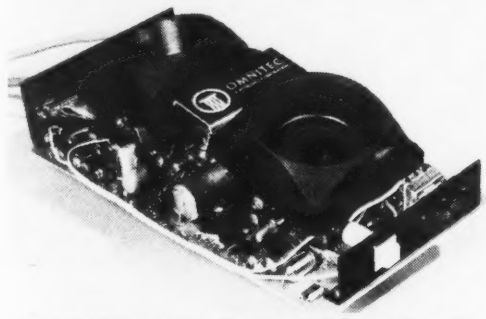
According to Miron, approximately 5,000 threats are received annually, not including the thousands more communicated to airlines.

The computer programs comprising the dictionary are based partly on information from the closed files of skyjackers and kidnappers who either gave up, murdered someone or committed suicide. The programs can distinguish discriminative cues in the verbal or written content of threats, explained Miron, who said he has been working as an unpaid consultant for the FBI.

Two programming languages have been selected for the word-content dictionary that would allow organizations to use their own existing computer resources.

One of these, an APL stem language, analyzes very brief threats while the threat is being communicated. The other, PL/I, is used to batch process threats accumulated from one source over time – as in the recent Hearst kidnapping case – or in single threats involving large amounts of verbiage, Miron said.

When queried on the present status of the project, Miron emphasized, "I'm arduously pursuing this idea. The routines are already running on the university's IBM 370/155.



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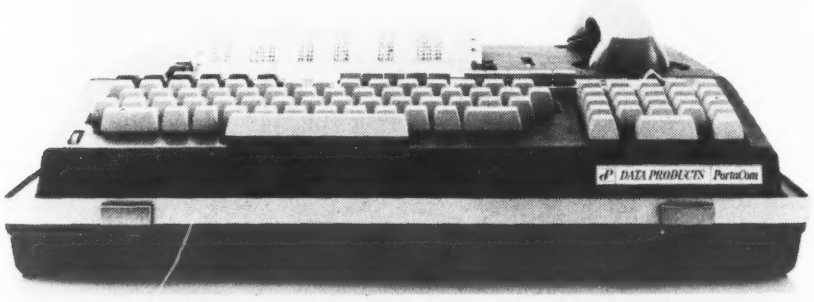

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For more subscription and listing information write: **Minicomputer Data Services, 20 Coventry Lane, Riverside, CT 06878**

COMPUTER INDUSTRY

CI Notes

Univac Signs for STC Units

LOUISVILLE, Colo. – Storage Technology Corp. (STC) will provide Univac with 6,250 bit/in. tape drives and controllers under a five-year contract.

Univac has placed an initial order for equipment valued at $10 million.

Under an option in the contract, STC may license Univac to manufacture the drives after purchasing a certain amount of equipment.

Itel Leases in Japan

SAN FRANCISCO – Itel Corp.'s Data Products Group has formed a joint venture firm, SIS Corp., to market Itel's System 370 Packaged Lease in Japan.

Other participants in the new firm in which Itel has a 45% interest are Showa Leasing Co. Ltd., 45%, and Bank of Tokyo, 10%. Sales and maintenance for SIS will be handled by Showa Electronics, Inc., a subsidiary of Showa Leasing.

Greyhound Buys Wyly Unit

DALLAS – Wyly Corp. has sold its Computer Leasing Co. to Greyhound Computer Corp. for an undisclosed amount of cash and notes. Wyly had been cash-hungry in order to meet financing requirements for its Data Transmission Co. (Datran) subsidiary.

HP Gets CRT Copier

MOUNTAIN VIEW, Calif. – Hewlett-Packard Co. (HP) has obtained a nonexclusive technology license from Photophysics, Inc. that covers techniques for making hard copies of images displayed on CRT screens.

"The license will provide HP with proprietary Photophysics technical and product knowledge as well as guidance and assistance in implementing the Photophysics photoconductor for use in HP products," said Dallas L. Talley, president of Photophysics.

Supershorts

Datapoint Corp. took delivery of the 20,000th Diablo Series 30 disk drive delivered to U.S. customers since 1969. Over 30,000 units are installed worldwide.

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Modular Computer Systems, Inc. has signed CJK Co. Ltd. as its representative in Japan and Korea.

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The Cullinane Corp. has signed Scientific Control Systems Ltd. to offer marketing and technical support in the British Isles for its Integrated Data Base Management System.

Study Forecasts Through 1983

European Remote Entry Sales to Soar

By Molly Upton
Of the CW Staff

LONDON – Sales of remote data entry systems in Europe are expected to jump from $458 million in 1974 to over $1 billion annually by 1982, with total sales of almost $8 billion from 1974 to 1983, noted Frost & Sullivan Ltd.'s report, "Remote and Source Data Entry Markets in Europe."

There will be a total of over one million keyboards or equivalent devices installed by 1983 for data entry purposes, the report added.

"By the end of 1983, almost one-half of all data entry in Europe will be performed away from the CPU or host computer," Frost & Sullivan predicted.

The drive toward remote entry will be spearheaded by demand for remote cluster systems as well as intelligent terminals with cassettes or floppy disks, the report said.

Sales of the key-to-cassette/diskette and intelligent keyboard category will show a sharp rise from $20 million in 1974 to $32 million in 1975, reaching $143 million by 1980 and $168 million by 1983, for a total value over the decade of $938 million.

Remote cluster systems will also show sharp growth, from $12 million in 1974 to $35 million in 1975. By 1980, sales will reach $144 million and, in 1983, $203 million, for a total value of $1 billion by 1983.

The remote cluster system and the intelligent key-to-storage system each will account for about 131,000 keyboard shipments during the next 10 years for a total of $2 billion in sales, Frost & Sullivan said.

In terms of percentage of market share, these two types will each possess about 30% by 1980, keypunches will have about 15%, and typewriter terminals and video display units each will have about 10%, the report noted.

"We believe the whole area of remote data collection in small offices will be revolutionized by systems of the [IBM] 3742 type and their successors which include sufficient intelligence in the terminal to provide for interactive data entry, hard-copy printout and inquiry mode operation with direct access to the host computer," said the report.

By 1978, single- or dual-station intelligent key-to-storage terminals will account for about 30% of the number of keyboards for remote data entry applications, the report said.

Sales of batch processor systems, however, will dwindle from $6 million in 1974 and 1975 to $3 million by 1978 and evaporate by 1979, according to the study.

Shared processor key-to-disk systems will be replaced by "more flexible communications-oriented remote cluster systems" which can operate off- or on-line and afford interactive data entry without being on-line to the host computer, the report said.

Keypunch Sales to Decline

Sales of keypunches will decline from $65 million in 1974 to $48 million in 1979 and remain constant through 1983, for a total sales value of $520 million.

Sales of key-to-tape units will rise from $10 million in 1974 and remain at $13 million from 1975 through 1979, then drop from $10 million in 1981 to $3 million in 1982, showing the effect of competition from inexpensive intelligent units with more attractive means of storage, Frost & Sullivan said.

Demand will be relatively constant for portable data recorders and data tablets at $4 million from 1976 to 1983.

Sales of single-unit printer terminals will top those of single video display units (VDU) until 1980, when VDU sales will grow from $40 million to $80 million, while sales of printer terminals will remain at $35 million, the study said.

Shipments of VDUs will increase eightfold between 1974 and 1983 for total sales volume of nearly $400 million. These figures exclude time-sharing, scientific and engineering markets, the report noted.

"As intelligence is built into VDUs at lower cost and with the advent of inexpensive printers which can be attached to these units, VDUs will eventually erode the typewriter terminal market and will be complementary to the intelligent key-to-storage market for applications where interaction with the host computer is necessary," the study predicted.

"There is little doubt bank terminal sales will be the largest single segment of the data entry market during the next 10 years," the report observed, predicting $2.5 billion in sales of bank terminals in the decade ending in 1983.

This should be a banner year for sales of bank terminals, jumping from $149 million in 1974 to $256 million in 1975.

The market will soften somewhat after 1976, but regain speed in 1980 with sales of $275 million, reaching $368 million in 1981 and ending the decade at $300 million, for a total sales value of $2.6 billion, according to the report.

Increasing sales to supermarkets and food departments will overshadow installations at department and variety stores by 1980, the report indicated. The point-of-sale (POS) market should grow from $22 million in 1974 to $120 million in 1983, with total sales of $850 million over the decade, Frost & Sullivan forecasted.

CDC '74 Earnings Take Nose-Dive To $3.7 Million; Contracts Cited

MINNEAPOLIS – A $30.7 million loss from computer operations contributed to the nosedive in 1974 earnings at Control Data Corp. (CDC).

Overall earnings dropped to $3.7 million or 13 cents a share compared with $60.9 million or $3.73 a share in 1974.

Last year, CDC's computer business earned $17.2 million.

Earnings of Commercial Credit, a finance services subsidiary of CDC, also declined. Computer operations and Commercial Credit have traditionally alternated in upholding corporate results.

Computer operations' 1974 revenues increased 16% to $1.1 billion from $948.2 million last year, while gross income from financial services rose 19% to $670.3 million.

During the fourth quarter, the firm lost $16 million or $1.03 a share compared with earnings of $15.2 million or 93 cents a share in the year-ago period.

Computer operations incurred a $24 million loss compared with earnings of $4.7 million in the same 1973 quarter, while revenues increased to $283.2 million from $277.9 million.

Special charges relating to large development contracts for advanced systems and charges from discontinued operations were the principal cause of the losses. High interest rates around the world were also a factor, the firm said.

In addition to the $15 million after-tax charge announced in the third quarter for discontinuance of a joint project with the Union Bank of Switzerland, there were also special charges of about $20 million after taxes resulting from development work under fixed-price contracts.

One such contract was a logistics system being developed with the U.S. Air Force.

Explaining the demise of the Swiss contract, CDC Chairman William C. Norris said, "The customer, the Union Bank of Switzerland, did not have the top-management capability to carry out its part of this revolutionary project involving application software development and the operation of an advanced large-scale computer system."

Steps taken during 1974 to improve profitability in 1975 included termination of some projects and operations and consolidation of some facilities, which resulted in about $7 million of after-tax

(Continued on Page 37)

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RAYTHEON

Contracts

Memorex Corp. has received a contract valued at more than $1.2 million from Eastern Airlines to supply, install and maintain six Model 3670 disk storage subsystems for Eastern's on-line reservation system.

Datacrown Ltd. has signed a contract with Bristol-Meyers Products Canada to provide DP services for the company through the Datacrown shared processing network. Bristol-Myers will phase out its IBM 360/30 and initially install six Datapoint 220 terminals.

University Computing Co. (UCC) has won a contract to design and implement an integrated financial management system for First Colony Farms, which includes providing a cost accounting system and the modification of UCC systems methods to the farm's operations.

Distronics Corp. has signed a facilities management contract with Hamilton Plumbing Supply Co.

Computer Sciences Corp. has been awarded a $450,000 design contract by the U.S. Army Electronics Command to design a consolidated telecommunications center for the Pentagon.

The American Chemical Society and Internationale Dokumentationsgesellschaft fuer Chemie m.b.H. (IDC) have concluded a long-term contract agreement which grants IDC the right to use and distribute in West Germany the publications, information services and computer-readable information files produced by the society's Chemical Abstracts Services Division.

Computer Sciences Corp. has been awarded a $4.1 million contract by the Chesapeake Division of the Naval Facilities Engineering Command to design, develop and install a data acquisition and control system for three ocean-simulator tanks in the U.S. Naval Academy.

Electronics Industry Situation 'Impossible,' Executive Warns

By Catherine Arnst
Of the CW Staff

LOS ANGELES – The electronics industry is faced by a "seemingly impossible situation" with manufacturers fighting inflation and recession simultaneously, according to Don Muller, senior vice-president of Pertec Corp.

The industry is in a period where cost curves are rising and selling prices are experiencing downward pressures, he told a recent meeting of the Western Electronics Manufacturers Association.

"In most periods in the past," he said, "rising costs could be handled by passing those costs on to customers through increased prices. However, during today's recessionary cycle with its associated reduced product demand, the ability to increase prices is impaired.

"This situation is further compounded in the peripherals industry as we must, for competitive reasons, make long-term pricing without protection for long-term cost increases," he added.

Optimistic About Future

Muller is optimistic about the future and suggested that if industry executives take a close look at their own situation they may find it is not so bad.

"At Pertec, although our rate of sales growth has flattened from our previous predictions, we continue to grow. In fact, we feel the DP and minicomputer markets will grow as much as 15% during 1975," he said.

Muller warned major cost-cutting programs should be approached with caution: "Programs born out of panic produce false economies that result in higher costs in the future."

He emphasized that reducing operating costs is a short-term solution. "Don't delay your long-term investments too long in areas such as research and development, building and construction, improving products and improved production techniques," he told the group.

"These are necessary if you expect to survive after the economic crunch is over."

WU Unit Organizes Teleprocessing Group

MAHWAH, N.J. – Western Union Teleprocessing, Inc. has established the Western Union Teleprocessing Group, organized into four divisions, each with a specific market area.

Western Union Banking Systems, headed by Tom L. Walker, will design and develop computer communications systems for major banks.

Teleprocessing systems for business and government will be handled by Western Union Information Systems with Bernard Weitzer as general manager.

Facilities Management

National Sharedata Corp. will provide banks with facilities management and related DP services under the direction of Daniel B. Stuart, and Distronics Corp., with Seymour Blau as president, will operate on-line information services for wholesale distributors.

Western Union Teleprocessing, a subsidiary of Western Union Corp., was formerly known as Teleprocessing Industries, Inc.

Pertec Reassigns Marketing Of Model 7100 CRT for OEM

CHATSWORTH, Calif. – Pertec Corp. has reassigned the marketing of its Model 7100 CRT terminal to the Peripheral Equipment Division.

Ralph Gabai, marketing manager for the division, said the terminal will be marketed to OEMs. Primarily applications are expected to be source data entry and remote inquiry via a data communications network.

The terminal, announced in October, is manufactured by Pertec's Business Systems Division, which also supplies Singer with a similar CRT terminal.

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NCR Earnings Up 21% for Record Year

DAYTON, Ohio – NCR Corp. attained record results with a 21% increase in earnings on a 9% rise in revenues during 1974.

Better margins on new electronic products and efficiencies achieved by the reorganization of marketing, manufacturing and research and development operations were responsible for the improved results, according to William S. Anderson, NCR president.

The fastest growing portions of the firm's equipment revenues continue to be data terminals and computer systems, he added.

Revenues from terminal and data entry systems rose 94% to $295.8 million compared with $152.6 million last year.

Revenues from computer systems totaled $385.7 million, an 18% gain over 1973's $327.8 million.

"When computer-related field engineering revenues, data center revenues and the sale of computer forms and supplies are included, NCR's computer systems business is now approaching three-quarters of a billion dollars," Anderson said.

Earnings for the year totaled a record $87.2 million or $3.53 a share compared with nearly $72 million or $3 a share last year.

Revenues also reached a new high, $1.98 billion compared with $1.82 billion in 1973.

Fourth-quarter revenues rose 8% to $626.4 million compared with $577.4 million in the same period last year.

Earnings, affected by higher taxes in certain international subsidiaries and adverse currency exchange adjustments, rose slightly to $35.3 million or $1.40 a share compared with $34.7 million, also $1.40 a share in the year-ago quarter.

Pretax income for the quarter totaled $70 million compared with $62.7 million a year ago, Anderson said.

Incoming orders rose 9% during the year, both domestically and abroad.

Things to Worsen, Forms Makers Told

PHOENIX – Business forms manufacturers should expect the current economic downturn to become more severe than the 1970-71 decline before returning to normal growth in mid-1976.

Edwin Masten, research director at International Business Form Industries, told an industry conference a steep decline in real output will be evident into the second quarter of 1975.

"Since forms industry shipments generally lag six to nine months behind changes in the gross national product, the economic slowdown which began in the first part of 1974 is now impacting the forms industry."

Masten recommended "a careful approach to the market, combined with constant communications with customers" to keep orders from dropping off.

If users perceive major market changes such as shorter delivery times, vigorous competition or an excess of paper stocks, they will be prone to trimming inventories, forcing the industry further into a downward spiral, he warned.

A panel discussion dealing with "Paper – The Crisis Yet to Come" noted that the present availability of paper for the forms industry has evolved from a lessening of demand from other businesses, not from an increase in supply.

In order to insure long-term pulp and paper supplies, Howard Lauer, vice-president of marketing for NCR Appleton Papers, Inc. recommended an increase in the standard sizes of rolls, a shift to lighter grades of paper and a standardization of roll widths.

Executive Corner

■ BASF Systems has announced the appointment of Guenter Grochla as president and has named Marsdin VanOrder, Robert Blanck and Uwe Bong vice-presidents of operations, audio products marketing and finance and administration, respectively.

■ John C. Collins has been appointed vice-president of marketing of Threshold Technology, Inc.

■ Vernon E. Sieling has been promoted to senior vice-president of marketing operations at Control Data Corp.

■ ECRM, Inc. has appointed John B. Callahan chairman and chief executive officer and Melvin J. Fennell president. Richard L. Martin has been promoted to executive vice-president and Amram Rasiel, who resigned as chairman, will continue with the company as a director.

■ Daniel O. Anderson has been promoted to vice-president of finance and administration for North American computer operations at Honeywell, Inc.

■ Carl J. Mock and Keven Cunningham have been appointed vice-presidents and comanagers and David C. Norman has been named director of customer services at Computac, Inc.

■ Jack George has been appointed vice-president of manufacturing at Qume Corp.

■ Jack Brand has been promoted to senior vice-president of University Computing Co.

■ John N. Irwin II has been reelected to the board of directors of IBM Corp.

■ Robert A. Grote has joined Business Systems Technology, Inc. as vice-president of marketing.

■ Stephen H. Clark has been appointed vice-president of marketing of Iomec, Inc.

■ Irving S. Shapiro has been elected to the board of directors of IBM.

■ Cornelius Perkins has been appointed associate director of engineering devices at Burroughs Corp.

■ Richard H. Lussier has been elected a corporate vice-president of Itel Corp.

■ Robert W. Kleinert and Henry J. White have been named senior vice-presidents and Richard D. Bulman has been appointed vice-president and group executive at the Service Bureau Co.

■ C. Oakley Mertz has been appointed vice-president at International Data Corp.

■ Daniel J. Flynn, general manager of field engineering; Gerald C. Galush, director of manufacturing; and Floyd M. Hartwig, chief engineer, have been appointed division vice-presidents at Data 100 Corp.

■ James L. Lee has been named vice-president and general manager of operations at Trusco Data Systems.

■ L.C. Whitney has joined National Data Corp. as group vice-president of marketing.

■ Robert E. Weissman, Alan C. Rievman and David S. Fehr have been elected to the board of directors of National CSS, Inc.

■ Morgan R. Walker has been named director of marketing for Varian Associates of Canada for data communications terminals and peripheral products.

■ Daniel P. Gillespie has joined Recognition Equipment, Inc. as vice-president of the Manufacturing/Field Service Group.

■ James Dobbie has been named vice-president and general manager of Memorex's Computer Media Group.

■ Rex J. Rasmussen has been appointed president of the Field Engineering Division of Itel Corp.'s Data Products Group.

■ Otis S. Page Jr. has joined California Computer Products, Inc. as consultant, antitrust litigation.

IPC Multiplexer Finds Supporters

ANAHEIM, Calif. – California Computer Products, Inc. (Calcomp) and Computer Investors Group, Inc. have taken steps to ensure maintenance, support and order fulfillment for customers of International Peripherals and Computer Corp.'s (IPC) block multiplexer.

IPC recently closed its doors. Its block multiplexer channel is used to attach Calcomp 3330-type drives to IBM 360/65s.

A Calcomp spokesman said current orders will be filled.

CDC '74 Earnings Take a Nose Dive

(Continued from Page 35)

charges.

"While financial results for 1974 were very disappointing, the company made good progress in building its computer services business," Norris said.

"Revenues from data services, for example, increased more than 25%, and we expect continuing rapid growth in this segment in 1975."

Profitable 1975

Norris expects the computer business to be profitable in 1975, assuming economic conditions do not worsen materially, but he cautioned the return to profitability would be gradual.

While revenues increased from all sources for the year, in the fourth quarter sales revenues fell to $130.2 million from $148.6 million. Rental and services continued to climb to $147.2 million from $126.2 million in the year-ago quarter.

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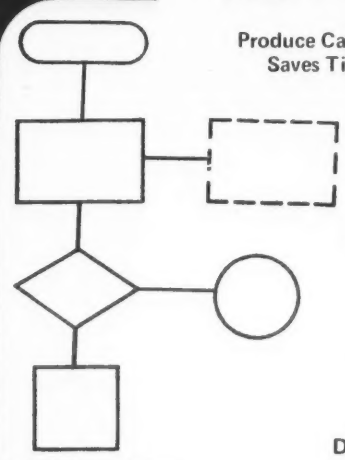

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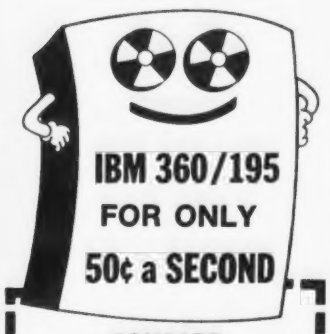

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East Europe Trade to Grow Rapidly

NEWPORT BEACH, Calif. – The market in Eastern Europe for DP and business machines is expected to grow from $76.2 million in 1972 to $220 million in 1978, according to a study from Mackintosh Consultants.

The market share, however, will decline from 26% to 21% of electronic products exported to Eastern Europe, the report added.

Telecommunications should grow from $26 million in 1972 to $210 million in 1978, with an increase from 8.9% of the market to 20%, the report said.

International News

Requirements vary from country to country. Yugoslavia and the USSR are the best potential customers for Western electronic products, while Bulgaria is the smallest, Mackintosh said.

In addition, the Bugarians are interested in cooperation for production of computer peripherals with the inclusion of their own printers.

Market Opportunities

Although the U.S. is finding itself in economic difficulties, significant market opportunities exist in Eastern Europe, as the Council of Mutual Economic Assistance countries are essentially independent of the Western economic and market forces, the report said.

In addition, the Eastern countries are likely to more liberally issue import licenses for high technology items than for non-essential items, according to the study.

However, Westerners must understand the idiosyncracies of the ways of doing business in these countries.

Market opportunities in Eastern countries are determined by the import levels set by government authorities. Values and percentages of total imports are assigned to each country and subdivided into economic sectors, the report explained.

IDC Program Offers Market Data On Eastern European Countries

WALTHAM, Mass. – An East-West Trade Program designed to provide market data and planning information on Eastern European countries to members of the computer industry is being offered by International Data Corp. (IDC).

The seven countries included in the program have over 350 million inhabitants, a gross national product of more than one trillion dollars and bought over $1.4 billion of U.S. products in 1974, according to Patrick J. McGovern, president of IDC.

Common Denominator

Each of the seven countries in Eastern Europe requires a slightly different approach, McGovern said, but they all have one factor in common: "Their economy is centrally planned, with the government trying to anticipate overall market needs in five year cycles.

"If you can make the right contacts to establish that you have a product, technology or service that fits within these economic plans, you can not only gain the attention of the buyers, but you can also get the necessary information to forecast," he said.

The program will be conducted in the seven member countries of the Council for Mutual Economic Assistance – Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Rumania and the USSR.

Clients of the IDC program will receive a specific evaluation of their products in each country, including an estimate of the sales that can be generated during the next one to five years, considering the country's needs and the client's competitive position.

In addition, IDC will arrange introductions to trade, government and industry contacts, provide assistance during the initial marketing phase and publish a marketing manual for each country in the client's product area.

The program is scheduled in two phases, each lasting approximately one year, with the first phase containing the six satellite countries and the second devoted to the USSR alone.

IDC is at 214 Third Ave., 02154.

Foreign Orders & Installations

The University of Cologne, Germany, has ordered a Control Data Corp. CDC Cyber 76 to support its communications network.

Burroughs Corp. has received an order from the Argentine air force for a B6700 system.

The Lummus Co. of Bloomfield, N.J. has purchased a Foxboro FOX 1 computer system for the process control system to be implemented at the Slovnaft project in Bratislava, Czechoslovakia.

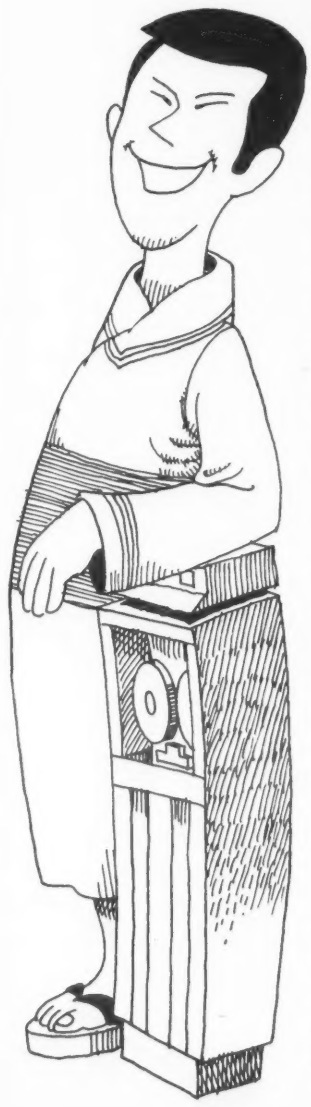
Prime Computer, Inc. has installed a time-shared Prime 300 coupled with a Prime 200 communications processor at Salford University Computing Laboratory in England.

A Univac 1106 has been ordered by the Public Transport Commission of New South Wales, Australia to improve customer service.

Tecsi-Software, Paris, has ordered Task/Master, a telecommunications monitor, from Turnkey Systems Inc.

Sanders Data Systems Ltd. has received an order from Computer and Accounting Services for programmable computer terminals to automate advertisement placements.

A Spanish bank, Banco Pastor, has ordered a Honeywell Series 6000 Model 6025 computer for transaction processing.



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Shukan Computer, Computerworld's sister publication in Japan, is a joint venture of Computerworld and the leading electronics publisher in Japan, Dempa Publications. Shukan is the only newsweekly for the computer community in Japan and with the combined resources of the two companies, it has the largest news gathering organization of its kind in the world.

Japanese businessmen read more than their American counterparts, and they place a greater value on the advertising they read. Buying decisions in Japan – unlike the common American system of one-man, "EDP Manager" control – are reached through development of consensus between several levels of operating management, including programmer and analyst levels. And Shukan goes to all these important buying influences. 23.5% of total circulation goes to Data Processing Management, 12.5% to Corporate Executives, and 27.9% goes to Professional Staff in the computer industry.

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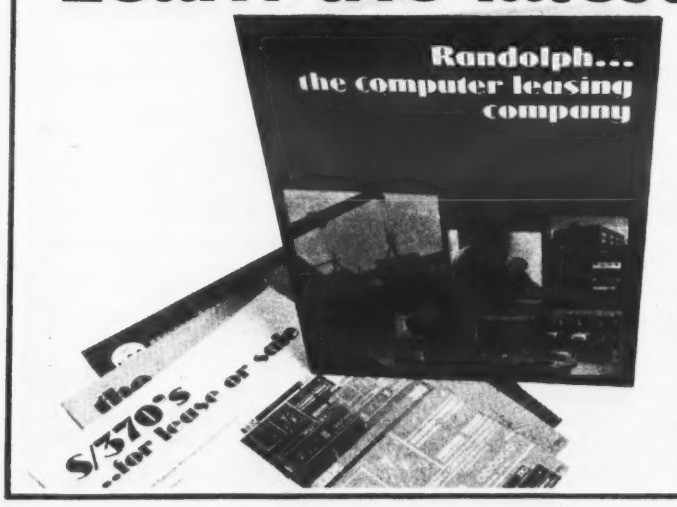

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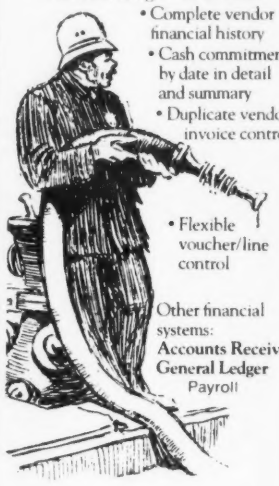

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Telex Turns Profit in Nine Months

TULSA, Okla. – Telex Corp. continued to turnaround with a profitable third quarter and nine months, aided by earnings of its Communications Group.

The Computer Products Group, however, maintained its unprofitable trend, although its third-quarter loss was less than that of the year-ago period, primarily because of an increase in equipment sales.

Telex had incurred losses in five consecutive quarters previous to the beginning of the current fiscal year.

In the third quarter, Telex earned $365,000 or 3 cents a share compared with a loss of $4.5 million or 43 cents a share in the same period last year.

This was accomplished despite declining revenues, which dipped to $24.5 million from $24.9 million in the year-ago quarter.

During the nine months, revenues rose to $81.3 million from $67.2 million. Earnings totaled $751,000 or 7 cents a share compared with a loss of $14.7 million or $1.40 a share in the 1973 period.

The Communications Group contributed a profit of $861,000 for the quarter and nearly $2 million for the nine months.

The Computer Products Group's domestic and Canadian operations lost $496,000 in the three months and $1.2 million in the nine months. The European operations of this group were profitable for both periods, the firm said.

While the group continues to emphasize sales of equipment to financial institutions and end users, there can be no assurance that the level of sales can be maintained in future periods.

Rental income from computer peripheral equipment on lease to customers decreased to $5.5 million for the three months compared with $6.2 million a year ago, due primarily to the sales of equipment that had been on lease with customers.

For the nine months, rental income was $17.6 million compared with $17.7 million in the same period last year.

Last month, Telex received a firm $2.8 million contract for tape drives and controllers from an unidentified systems manufacturer. A provision for optional purchase of additional equipment "could substantially increase the firm portion of the contract," Telex said.

As of Dec. 31, Telex had firm orders for sale or lease equipment having a sales value of $18 million compared with $28.9 million a year ago.

During calendar 1974, the firm paid off $15.2 million of loan principal and $11.4 million in interest. Telex is currently reducing debt at about $2 million a month, the firm said.

Telex observed the judgment of $18.5 million payable to IBM, assessed by the Tenth Circuit Court of Appeals, does not become a firm obligation of Telex until all appeals procedures are completed.

No provision has been made in current financial statements to reflect the appeals court's decision, the firm said.

DEC Earnings Drop in Quarter

MAYNARD, Mass. – Six-month earnings and revenues were up over those of a year ago at Digital Equipment Corp., but second-quarter earnings dipped despite a 31% rise in revenues.

The quarterly decline was attributed to the firm's continued investment in its sales and service organization and ongoing commitment to its research and engineering programs, in keeping with its longer term growth objectives.

DEC earned less than $9.8 million or 81 cents a share compared with $9.9 million or 85 cents a share in the year-ago quarter.

Revenues jumped to $126.8 million from $96.9 million in the 1973 second quarter.

For the six months, revenues rose 34% to $238.6 million compared with $178.4 million in the same period last year.

Earnings rose to nearly $17.3 million or $1.44 a share compared with $16.5 million or $1.43 a share in the 1973 half.

Despite the quarterly dip in earnings, DEC still expects its business to expand at a rate greater than the industry growth rate, a spokesman said.

The quality of incoming business, coupled with improved productivity and the positive results of a broad cost-control program, provide a degree of optimism for the full year, he said.

The shipment level of small computers and larger systems, the Decsystem-10 and PDP-15, maintained a satisfactory level during the second quarter.

In addition to evidence of potentially significant growth in spending for computers in many industries, the recent introduction of new minis and systems with better price/performance should favorably impact DEC's business, the firm said.

Incoming orders during the second quarter were ahead of both the preceding first quarter and the second quarter last year.

Overseas sales subsidiaries reported satisfactory levels of business during the second quarter. Sales and service organizations continue to produce increased revenues in major countries served by DEC.

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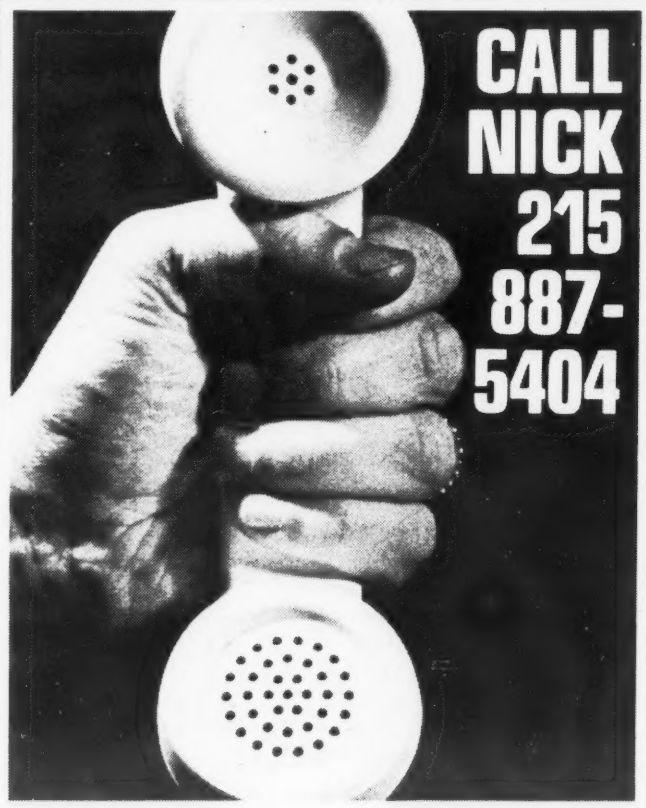

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Earnings Reports

APPLIED MAGNETICS
Three Months Ended Dec. 31

	1974	1973
Shr Ernd	$.02	$.05
Revenue	15,637,000	12,783,000
Earnings	92,000	201,000

CODEX
Three Months Ended Dec. 31

	1974	1973
Shr Ernd	$.73	$.56
Revenue	6,092,000	3,223,000
Tax Cred	.....	386,000
Earnings	1,077,000	818,000

SYSTEMS ENGINEERING LABS
Three Months Ended Dec. 27

	1974	1973
Revenue	$4,505,418	$2,817,373
Loss	98,491	3,997,230
6 Mo Rev	9,030,633	5,917,118
Loss	208,310	4,775,476

EBS DATA PROCESSING
Year Ended July 31

	1974	1973
Shr Ernd	$.01	$.04
Revenue	8,553,000	8,090,000
Earnings	61,700	204,000

DATAPRODUCTS
Three Months Ended Dec. 28

	1974	1973
Shr Ernd	$.20	$.28
Revenue	24,916,000	18,292,000
Tax Cred	.....	691,000
Earnings	1,372,000	1,913,000
9 Mo Shr	.62	.80
Revenue	71,461,000	54,408,000
Tax Cred	.....	1,957,000
Earnings	4,232,000	5,417,000

AUTOMATIC DATA PROCESSING
Three Months Ended Dec. 31

	1974	a1973
Shr Ernd	$.46	$.39
Revenue	34,442,000	27,953,000
Earnings	2,921,000	2,484,000
6 Mo Shr	.84	.71
Revenue	65,489,000	53,098,000
Earnings	5,302,000	4,466,000

a-Restated.

COMPUTER SCIENCES
Three Months Ended Dec. 27

	1974	1973
Shr Ernd	$.07	$.05
Revenue	45,797,000	36,296,000
Earnings	938,000	a698,000
9 Mo Shr	.17	.08
Revenue	128,076,000	106,189,000
Earnings	2,379,000	a1,126,000

a-Includes net gain of $464,000 from sale of investment.

COM-SHARE
Three Months Ended Dec. 31

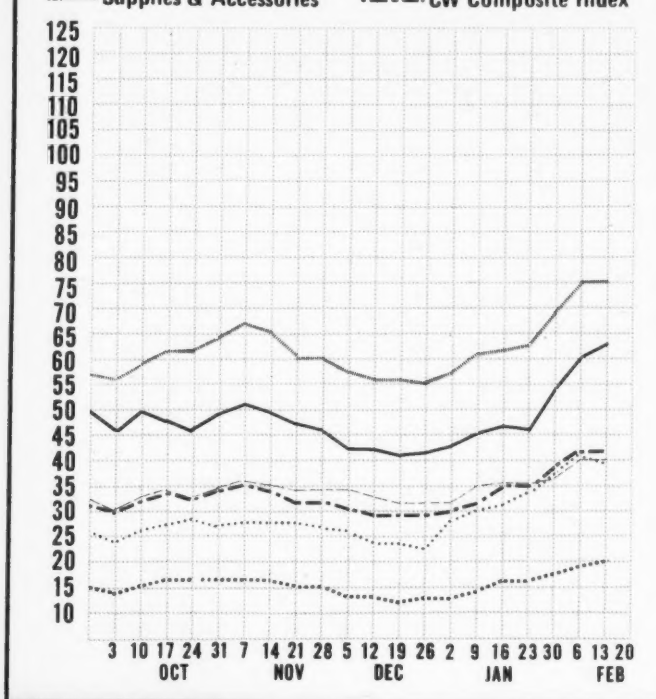
	1974	a1973
Shr Ernd	$.21	$.25
Revenue	2,737,545	2,335,308
Tax Cred	132,000	163,000
Earnings	287,011	325,917
6 Mo Shr	.58	.33
Revenue	5,640,059	4,479,299
Tax Cred	373,000	217,000
Earnings	788,011	433,906

a-Restated.

PERTEC
Three Months Ended Dec. 27

	1974	1973
Shr Ernd	$.20	$.07
Revenue	11,538,000	7,269,000
Disc Op	.....	(264,000)
Tax Cred	.....	56,000
Earnings	619,000	203,000
6 Mo Shr	.31	.22
Revenue	21,540,000	15,119,000
Disc Op	.....	524,000
Tax Cred	.....	262,000
Earnings	960,000	661,000

COMPUTERWORLD Computer Stocks Trading Indexes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Computerworld Stock Trading Summary

CLOSING PRICES THURSDAY, FEBRUARY 14, 1975

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

E X C H		1974 RANGE (1)	CLOSE FEB 14 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	86 1/4	+7 3/8	+9.3
O	COMPUTER AUTOMATION	2- 14	4 1/4	- 7/8	-17.0
N	CONTROL DATA CORP	10- 38	16 1/2	+2 7/8	+21.1
N	DATA GENERAL CORP	10- 38	17	+1 3/8	+8.7
O	DATAPOINT CORP	5- 15	9 1/4	+1 1/4	+15.6
O	DIGITAL COMP CONTROL	1- 5	3/4	- 1/4	-25.0
N	DIGITAL EQUIPMENT	46-121	74 3/4	+2 3/4	+3.8
N	ELECTRONIC ASSOC.	1- 3	1 7/8	+ 1/4	+15.3
A	ELECTRONIC ENGINEER.	4- 11	6 5/8	- 1/8	-1.8
N	FOXBORO	19- 48	27 1/4	- 3/8	-1.3
O	GENERAL AUTOMATION	6- 40	6 7/8	+ 5/8	+10.0
O	GRI COMPUTER CORP	1- 2	1/4	0	0.0
N	HEWLETT-PACKARD CO	54- 90	79 7/8	+7 7/8	+10.9
N	HONEYWELL INC	18- 86	32 1/2	+3 5/8	+12.5
N	IBM	152-251	215 1/2	+19 1/2	+9.9
O	INTERDATA INC	8- 22	18 3/8	0	0.0
O	MEMOREX	2- 5	3 1/8	+ 1/8	+4.1
O	MICRODATA CORP	1- 5	2 5/8	0	0.0
N	NCR	14- 40	24 1/4	+4 1/8	+20.4
N	RAYTHEON CO	21- 39	33 1/8	+1 3/8	+4.3
N	SINGER CO	10- 40	12 1/4	- 1/2	-3.9
N	SPERRY RAND	24- 44	33 3/4	+2	+6.2
A	SYSTEMS ENG. LABS	1- 3	2	0	0.0
N	TEXAS INSTRUMENTS	60-115	83	+5 3/8	+6.9
O	ULTIMACC SYSTEMS INC	1- 2	2 1/4	+ 1/2	+28.5
N	VARIAN ASSOCIATES	6- 13	8 3/4	+ 5/8	+7.6
N	WANG LABS.	7- 20	9 5/8	- 1/2	-4.9
N	XEROX CORP	50-127	77 1/2	+4 1/8	+5.6
	LEASING COMPANIES				
O	BRESNAHAN COMP.	2- 2	2 1/8	0	0.0
O	COMDISCO INC	1- 7	1 5/8	- 1/4	-13.3
A	COMMERCE GROUP CORP	2- 6	2 3/8	0	0.0
O	COMPUTER EXCHANGE	1- 1	3/8	0	0.0
A	COMPUTER INVSTRS GRP	0- 4	1 1/4	- 3/8	-23.0
O	COMP. INSTALLATIONS	1- 1	1/8	0	0.0
M	DATRONIC RENTAL	1- 1	5/8	0	0.0
A	DCL INC	0- 1	1/2	0	0.0
N	DPF INC	2- 5	3 3/4	- 1/8	-3.2
O	EDP RESOURCES	2- 3	3 1/4	0	0.0
A	GRANITE MGT	1- 3	1 1/2	+ 1/4	+20.0
A	GREYHOUND COMPUTER	2- 6	2 1/4	- 1/4	-10.0
A	ITEL	3- 6	5 3/8	+ 3/8	+7.5
N	LEASCO CORP	5- 12	7 5/8	- 1/8	-1.6
O	LEASPAC CORP	1- 2	1/2	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	1- 5	2 3/8	- 3/4	-24.0
A	PIONEER TEX CORP	2- 10	2 3/8	- 3/8	-13.6
A	ROCKWOOD COMPUTER	0- 1	1/2	- 1/8	-20.0
N	U.S. LEASING	5- 24	11 1/8	-1 5/8	-12.7
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	5/8	0	0.0
A	APPLIED DATA RES.	1- 3	1 5/8	- 1/8	-7.1
O	APPLIED LOGIC	1- 1	1/8	0	0.0
N	AUTOMATIC DATA PROC	21- 57	40 1/2	+3 1/4	+8.7
O	BRANDON APPLIED SYST	1- 1	3/8	+ 1/8	+50.0
O	CENTRAL DATA SYSTEMS	4- 6	3	0	0.0
O	COMPUTER DIMENSIONS	1- 3	1 5/8	0	0.0
O	COMPUTER HORIZONS	1- 5	3/8	0	0.0
O	COMPUTER NETWORK	1- 2	1 3/8	+ 1/4	+22.2
N	COMPUTER SCIENCES	2- 4	2 3/4	+ 1/8	+4.7
O	COMPUTER TASK GROUP	1- 1	1/2	+ 1/8	+33.3
O	COMPUTER TECHNOLOGY	1- 1	1/2	0	0.0
O	COMPUTER USAGE	2- 4	2 1/2	+ 1/8	+5.2
O	COMRESS	1- 1	1/8	0	0.0
O	COMSHARE	2- 4	3 1/4	0	0.0
N	CORDURA CORP	1- 4	1 1/2	- 1/4	-14.2
O	DATATAB	1- 3	1 1/4	0	0.0
A	ELECT COMP PROG	1- 1	1/4	0	0.0
N	ELECTRONIC DATA SYS.	11- 25	16	+ 1/4	+1.5
O	INFONATIONAL INC	1- 2	1/8	0	0.0
O	I.O.A. DATA CORP	1- 1	1/4	0	0.0
O	IPS COMPUTER MARKET.	1- 1	1/4	- 1/8	-33.3
O	KEANE ASSOCIATES	2- 4	1 3/4	0	0.0
O	KEYDATA CORP	1- 6	2	+ 1/8	+6.6
O	LOGICON	2- 5	3 5/8	+ 1/8	+3.5
A	MANAGEMENT DATA	1- 2	1 1/2	0	0.0
O	NATIONAL CSS INC	5- 37	9 1/2	- 3/4	-7.3
O	NATIONAL COMPUTER CO	1- 1	1/4	0	0.0
A	ON LINE SYSTEMS INC	9- 30	11 5/8	+ 1/4	+2.1
N	PLANNING RESEARCH	2- 3	2 3/4	- 1/4	-8.3
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	1- 5	2 1/4	+ 1/8	+5.8
O	SCIENTIFIC COMPUTERS	1- 1	7/8	- 1/8	-12.5
O	SIMPLICITY COMPUTER	1- 1	1/4	0	0.0
O	TCC INC	1- 1	1/8	0	0.0
O	TYMSHARE INC	6- 12	9 3/4	+ 5/8	+6.8
O	UNITED DATA CENTER	2- 4	2 7/8	0	0.0
A	URS SYSTEMS	2- 4	2 1/4	- 1/4	-10.0
N	WYLY CORP	1- 5	2 1/2	- 1/8	-4.7
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	3- 11	5 1/2	+ 1/8	+2.3
O	ADVANCED MEMORY SYS	1- 7	2 3/8	+ 1/8	+5.5
N	AMPEX CORP	2- 5	4 1/8	0	0.0
O	ANDERSON JACOBSON	1- 4	2	- 1/4	-11.1
O	BEEHIVE MEDICAL ELEC	1- 7	2	+ 1/8	+6.6
A	BOLT,BERANEK & NEW	5- 9	6 5/8	0	0.0
N	BUNKER-RAMO	3- 8	5 5/8	- 3/8	-6.2
A	CALCOMP	4- 11	5	+ 1/2	+11.1
O	CAMBRIDGE MEMORIES	3- 16	3 1/2	0	0.0
N	CENTRONICS DATA COMP	7- 23	12	+1	+9.0
O	CODEX CORP	8- 19	19 1/4	+ 1/4	+1.3
O	COGNITRONICS	1- 2	3/8	0	0.0
O	COMPUTER COMMUN.	1- 2	1/2	+ 1/8	+33.3
A	COMPUTER EQUIPMENT	1- 2	1 3/8	- 3/8	-21.4
O	COMPUTER MACHINERY	1- 5	1 1/4	- 1/4	-16.6
O	COMPUTER TRANSCEIVER	1- 2	7/8	0	0.0
N	CONRAC CORP	10- 22	16	0	0.0
O	DATA ACCESS SYSTEMS	2- 3	1 1/8	-1 3/8	-55.0
O	DATA 100	4- 13	7 1/8	+ 7/8	+14.0
A	DATA PRODUCTS CORP	2- 4	3	+ 1/8	+4.3
O	DATA RECOGNITION	1- 1	1/4	0	0.0
O	DATA TECHNOLOGY	2- 4	1 5/8	0	0.0
O	DECISION DATA COMPUT	3- 13	4 7/8	+ 1/8	+2.6
O	DELTA DATA SYSTEMS	1- 2	3/8	0	0.0
O	DIAN CONTROLS	1- 2	5/8	0	0.0
N	ELECTRONIC M & M	1- 4	1 7/8	- 1/4	-11.7
O	FABRI-TEK	1- 3	1	- 1/8	-11.1
O	GENERAL COMPUTER SYS	1- 4	1 3/4	0	0.0
N	GENERAL ELECTRIC	30- 65	42 1/8	+2	+4.9
N	HAZELTINE CORP	2- 7	3 3/8	- 1/8	-3.5
O	INFOREX INC	1- 5	2 1/4	- 1/4	-10.0
O	INFORMATION DISPLAYS	1- 1	1/8	0	0.0
O	INFORMATION INTL INC	6- 14	10	+ 1/4	+2.5
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	1/4	0	0.0
A	MILGO ELECTRONICS	6- 18	12 3/8	+1 1/2	+13.7
N	MOHAWK DATA SCI	1- 4	2	0	0.0
O	ODEC COMPUTER SYST.	1- 3	3/4	0	0.0
O	OPTICAL SCANNING	2- 6	1 7/8	- 1/8	-6.2
O	PERTEC CORP	1- 6	2 3/4	+ 1/8	+4.7
A	POTTER INSTRUMENT	1- 5	1 3/4	0	0.0
O	PRECISION INST.	1- 3	1 1/4	+ 1/2	+66.6
O	QUANTOR CORP	2- 8	4	+ 1/2	+14.2
O	RECOGNITION EQUIP	2- 5	4 3/4	+1 5/8	+52.0
N	SANDERS ASSOCIATES	2- 8	4 1/4	+ 5/8	+17.2
O	SCAN DATA	1- 2	1	- 1/4	-20.0
O	STORAGE TECHNOLOGY	6- 15	8 3/4	+1 5/8	+22.8
O	SYCOR INC	4- 13	8 1/4	+1 1/2	+22.2
O	TALLY CORP.	1- 4	2	+ 1/8	+6.6
O	TEC INC	1- 7	3	+ 1/2	+20.0
N	TEKTRONIX INC	18- 48	25	+ 3/4	+3.0
N	TELEX	1- 4	1 1/2	- 1/8	-7.6
O	WANGCO INC	3- 13	4 7/8	0	0.0
O	WILTEK INC	1- 8	3 1/4	+1	+44.4
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 6	5 3/4	- 1/4	-5.0
A	BARRY WRIGHT	4- 7	5 7/8	- 1/8	-1.7
O	CYBERMATICS INC	1- 2	3/4	0	0.0
A	DATA DOCUMENTS	23- 54	39 1/8	+4 1/4	+12.1
O	DUPLEX PRODUCTS INC	6- 17	16 1/2	+ 1/2	+3.1
N	ENNIS BUS. FORMS	4- 7	5 7/8	0	0.0
O	GRAHAM MAGNETICS	5- 11	7 3/4	0	0.0
O	GRAPHIC CONTROLS	6- 11	11	0	0.0
N	3M COMPANY	43- 79	48 1/2	-1 1/4	-2.5
O	MOORE CORP LTD	33- 57	46	+2	+4.5
N	NASHUA CORP	16- 45	17 1/8	-3 7/8	-18.4
O	REYNOLDS & REYNOLD	6- 35	13 1/2	- 1/2	-3.5
O	STANDARD REGISTER	10- 16	14 3/4	- 1/4	-1.6
O	TAB PRODUCTS CO	4- 11	7	- 1/4	-3.4
N	UARCO	13- 23	19 5/8	+ 3/8	+1.9
A	WABASH MAGNETICS	3- 7	4 3/8	+ 1/4	+6.0
N	WALLACE BUS FORMS	14- 24	18 3/8	- 3/8	-2.0

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
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